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Entered as second-class matter January 3, 1906, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

Total amount invested in this road for 18 years now saved every 10 months!

THIS is Wood County's heaviest traveled road. All automobiles and motor trucks in transit overland around the western end of Lake Erie from Detroit and Toledo to the East must drive over this highway. In fact, most of the overland motor traffic to the South also takes this route.

Mr. John F. Gallier, County Surveyor of Wood County, recently figured that this highway carries 2,000 tons per day for its entire length of 7.36 miles, or more than 5,330,000 ton-miles per year!

This road is a Tarviated highway, and in a very interesting article Mr. Gallier develops the fact that every ten months the saving in the cost of operating motor traffic over this highway, as compared with that on a well-drained clay road, equals the total investment in the road for the past eighteen years.

Space is too limited to give Mr. Gallier's figures in detail, but a copy of the article, which gives the history and maintenance figures of the road since 1900, will be sent to any interested road engineer or taxpayer upon request.

Briefly, the total investment in the road for 18 years, including three Tarvia treatments, is \$99,367.63, or a trifle more than \$13,500 per mile.

Figuring carefully and conservatively, Mr.



Rideout Road, Toledo, Ohio. All during 1918 this road was traversed by Army trucks being driven to the Atlantic seaboard. Macadam road resurfaced with "Tarvia-X" in 1913 and treated with "Tarvia-B" in 1916 and 1918.

Gallier has worked out the difference in cost of gasoline, tires and oil alone (not taking into account the saving in wear and tear on automobiles and trucks), for traffic over the Tarvia road as compared with the same traffic over a well-drained clay road. Reduced to totals, the figures are:

Total average daily cost of gasoline, tires and oil for motor traffic on clay road	\$714.62
Total average daily cost of gasoline, tires and oil for motor traffic on Tarvia road	381.73
Daily difference in favor of Tarvia road	\$332.89
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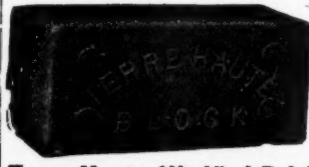
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City officials and civic organizations are particularly requested to send to Municipal Journal and Public Works regularly their annual and special reports.

Information Bureau

The Information Bureau, developed by twenty-one years' research and practical experience in its special field, is at the command of our subscribers at all times and without charge.

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USING CONVICTS FOR ROAD CONSTRUCTION.

The increasing use of convicts in road work, both state and county, and the general approval and satisfactoriness of such use, were shown by the symposium on the subject in last week's issue. In every case the road officials had concluded that good results as to construction could be obtained with a saving in cost; while the benefit to the convicts themselves is generally conceded.

In some respects the opinions differed, however. Utah's highway engineer says the men must be kept in a compact organization to prevent escapes, while in Wyoming the men were sent to points thirty miles away without guards; and the efficiency of two Rhode Island gangs varied considerably. Probably the opinion of state engineer B. M. Atwood of Arizona furnishes the explanation for different experiences—that good work and freedom from escapes is dependent upon the leadership or management. In Rhode Island the difference in these respects was attributed to this and also to the food and housing furnished. It would seem probable that the temperament that leads many men to yield to an impulse to break the law would also make them more susceptible to the character of the treatment they receive.

The opinion of Mr. Patterson that the best results are secured by using middle aged convicts, because they are more reconciled to their imprisonment than the younger ones, is interesting; as is that of many of those whose opinions are quoted, that it is advisable to give money, reduction of sentence or better food to those who serve faithfully in the road work.

TYPHOID FROM POLLUTED STREAMS.

Oklahoma City discharges its sewage into the North Canadian river, and the State Health Department calls attention to the fact that all the deaths from typhoid fever in Oklahoma county last year were along this river and that farmers and townspeople along the river below the city are suing it for \$125,000 damages. The inference would seem to be that Oklahoma City is morally responsible for all the typhoid death in the county, and may be held legally responsible for pollution of the stream.

But is this quite fair? Do none of these suing towns and farmers discharge any pollution of their own into the river? And should they not be charged with "contributory negligence" in using unpurified water from the river for drinking purposes? Every stream that flows through an inhabited area is more or less contaminated, and every one knows or should know that he runs a risk in drinking water from such a stream before it has been filtered or sterilized. Oklahoma City probably

should treat its sewage to prevent undue pollution of the river, but few hold today that a city is either legally or morally obligated to eliminate all germs from its sewage before discharging it into a stream or lake; such purification, while not impossible, would be impracticable.

Cities should treat their sewage to a degree that is reasonable, considering the size of stream receiving it and other conditions. But cities or individuals must purify the water of a stream if they wish to drink it with safety; if they fail to do so they are themselves largely to blame for any injurious results.

HYDRANT RENTALS.

In this issue, in connection with the table on "Meter Rates and Fire Protection," is given a brief discussion of the rates paid to private companies and municipal departments for fire protection, generally in the form of hydrant rental. There is a continually recurring interest in this subject among officials of cities served by private water companies; while an ever-increasing number of water departments receive, as cash or credit, an allowance from the city for fire protection afforded by the municipal plants.

The very wide range in hydrant rates paid in different cities is probably due to the failure, until within the past five or ten years, to recognize the existence of any logical basis for such payments. Private companies got whatever they could for fire hydrants, while probably the majority of municipal departments based their

charges upon the precedent offered by the private companies. If the payment made for each hydrant were simply sufficient to cover the interest and the depreciation on its cost plus the cost of keeping the hydrant in repair, the amounts paid would be very small. It seems always to have been recognized, however, that the payment for the hydrant was not for the hydrant alone but for the service rendered by means of it.

This subject of hydrant rental has already been discussed in *Municipal Journal* several times and it seems to us that the theory advocated by engineers and committees of the water works associations, that the payment for fire protection should be based upon the total cost to the company or department for furnishing such protection in addition to what the cost would be for furnishing water for consumption only, is the only logical one.

This is practically the basis of payment in several cities referred to in this issue which pay, for fire protection, a certain amount per mile or per thousand feet of main. A few cities apparently base the payment on the value of the protection to the community, either as a certain rate on the assessed valuation of the property protected, or as a fixed amount per capita of the population in the protected district. There is something to be said in favor of the latter ideas, but present tendencies in all public utilities seem to be toward basing payment on cost of service to producer rather than on its value to the parties served.

SOME LESSONS FROM FRENCH ROADS

These Macadam Roads Carried the Heaviest Traffic Known—Bituminous Treatment Proved Beneficial—Over Eight Hundred Million Dollars' Worth of Macadam and Gravel Should Be Improved, Not Destroyed.

By MAJOR E. A. KINGSLEY.*

France covers an area of some 207,054 square miles. Texas spreads out over 262,398 square miles. The five central states, Ohio, Indiana, Illinois, Wisconsin and Michigan cover 251,864 square miles. This comparison will give one the relative size of the sister republic of Europe.

Prior to America's entry into the great war, a small section of territory in the extreme northern part of France had been given over to army movements. The battle fronts and battle grounds lay between the Vosges mountains and the north coast line. North of a line drawn east from the Bay of St. Michel to the north point of the Franco-Swiss border, practically all of the intensive training and warfare of the French, English and Belgian armies was conducted.

This north section of France covers less than one-third the total area of the country. The balance of the country to the south saw but little of the real war activities. True, there were many permanent camps in which soldiers were concentrated and trained. And many temporary camps were built in various sections of the south. Used as concentration and training centers, these camps were busy ones but their activities were each confined to a limited area.

After the United States had declared war against the Hun, preparations were immediately made by the American Army staff for "America's invasion of France." The entire south section of the country was given over. Many of the permanent camps were evacuated by the French and taken over by the Americans. Towns, cities and communities were turned over to the American Army and hundreds of new camps, new temporary hos-

pitals and various other industries necessary to an immense army were planned and construction was begun.

The base ports, Le Havre, Bordeaux and Marseille were given over in part to American shipping. Brest and St. Nazaire were practically given over to the Americans. As the fighting line was north and east of Paris, American troops and supplies had to be transported entirely across France. St. Nazaire became the principal base port, with Bordeaux a close second.

Early in 1918 the time-honored division of the army known as "Line of Communication" was reorganized and expanded into the "S. O. S."—the Service of Supply. This, as the name would indicate, covered every branch of service necessary for supplying the needs of the army at the front. It became immediately one of the most important sections of the army. It established warehouses, built factories and repair shops, operated railroads, took over motor transportation, and in fact conducted every branch of industry necessary to feed, clothe and arm the real soldiers at the front. The S. O. S. was the business end of the army.

FRENCH ROADS FOR AMERICAN TRAFFIC.

All supplies had to be transported from the base ports in the west to the armies in the east, and in addition to several double-track lines of railroad, the S. O. S. was compelled to augment its lines or ways of communication between these with motor transportation. This would not have been feasible but for the splendid system of French highways and their excellent condition.

A great distributing depot had been established at Is-sur-Tille in eastern France, as near the front lines as possible and about 450 miles from the ports at St. Nazaire. From this depot supplies and equipment were rushed directly forward to the fighting forces. Necessarily, then, Is-sur-Tille must be kept well stocked and

* Superintendent of Roads, Intermediate Section, A. E. F., France.

the problem became very largely one of transportation. Railroads were early taxed to their limit and thousands of trucks and automobiles were then called into service and the world renowned highways of France became great arteries of traffic over which American army supplies were rushed forward by the Americans to the Americans.

Near the centre of France is the ancient city of Bourges, and at this city the roads from ports Bordeaux, St. Nazaire and Brest met, and from Bourges east a continuous line of laden trucks moved towards the front, all of the American supplies being carried over this one route.

From Bourges through Nevers to Decize (about 60 miles), this enormous, continuous traffic was over National roads. From Decize to Luzy, a distance of about 25 miles, the route was via a departmental route. From Luzy to Is-sur-Tille the roads were entirely National.

These lines of S. O. S. communication were called upon to sustain perhaps as severe traffic as ever a road is required to care for. It is true that the intensive traffic just behind the battle lines was far more severe than the S. O. S. traffic, but nothing in peace times ever approaches even approximately any such traffic. Consequently it is from experiences on the lines of communication that lessons beneficial to America's road problem must be learned. Traffic on these roads more nearly approached the heaviest traffic on the main highways of the United States, present and future.

MACADAM GAVE GOOD SERVICE.

Volumes have been written of the wonderful French roads, but too much has not been said. And yet these roads, like the roads at the front, were just plain water-bound macadam. But they stood the test. Nothing other than macadam, and very quickly built macadam, could have been used at the front. One "expert" writing from Washington in the summer of 1917 told us that "Belgian Blocks or Portland cement concrete were the only roads which could be satisfactorily used." This gentleman afterwards came to France but he was not sent to any advanced-section road work.

Two or three reasons may be ascribed for the amount of macadam roads in France. In the first place, nearly all of the country is underlain with rock, much of it being a fairly good quality of lime rock. The climate, too, being damp, is favorable for water-bound macadam. Perhaps the most valid reason, however, is the abundant labor prevalent at so little cost. Labor has been the cheapest commodity in France. Maintenance was continuous and, with the cheap labor, waterbound macadam roads filled the bill.

BITUMINOUS ROADS IN FRANCE.

Near some of the larger cities considerable stone block pavement has been laid and prior to 1914 quite a little tar had been used for penetration work. During the war, little if any block pavement was laid and only a small amount of tar was used. But such stretches of treated road as there were, even with but little maintenance, proved the efficacy of bituminous treatment, and the French highway engineers are exceedingly strong advocates of such treatments. Where the old macadam had been well treated, the roads stood the new intensive war traffic wonderfully. The writer succeeded in obtaining from this country a few barrels of bituminous material for use on his section of this work, and when this fact became known to the French engineers they were greatly elated and constantly importuned him for more of such material.

Now from "Sunny France," (the country of perpetual rains) the army of 2,000,000 men has returned. This

army has seen the wonderful roads of France and discovered first-hand what roads mean to a community. A full 2,000,000 is thus added to the active "road boosters" of the United States. A very large percentage of these millions of voters and tax-payers have often traveled over these roads and have seen the character and worth of them, and they will ask why we in America can not have thousands and thousands of miles of the same kind of roads.

NO "BEST ROAD" FOR ALL THE UNITED STATES.

But should we in the United States have the same kind, or some other? The Paving Brick Association will tell you that brick is the only satisfactory and absolutely perfect road material. The Cement Association, anxious to see the output of the cement mills increased, will send its representative any where at any time to tell you his story and assure you that Portland cement alone can give you the road required. In Boston you are taught that Warrenite makes the perfect road; in New York you learn that Bito-slag is really the material that you wanted, but in Philadelphia you find out you had been led astray as Trinidad asphalt in some form should have been used. Down in Arkansas you find that you are all wrong, for macadam roads are the thing, while the thousands of miles of Texas gravel roads convince you that old mother earth has a supply of the right material for you in many localities. Then after a ride around Bexar county you are sure that Texas rock asphalt is the real spring tonic for your weakened road conditions.

None of these will solve the problem for all localities. It is a problem that must be solved by the engineers (not by politicians and promoters) after due investigation as to climate, traffic, local material, finances and a myriad of other important things. The writer has no quarrel to pick with promoters. They are essential in road work and the hosts of honest ones (there are many, really) are valuable to the engineer and the community. Perhaps no one man has done more in the cause of good pavements and material than Will P. Blair of the Paving Brick Association. So, too, has the Cement Association been of wonderful benefit to the engineers in aiding them to obtain a correct knowledge of their materials and the uses of them. The asphalt people, the bitulithic organizations, and others engaged in legitimate promotion are very valuable aids. But it is for the engineer to discriminate between legitimate, educational promotion on the one hand, and promotion for sales only and a "public be damned" policy on the other.

This distinction must always be borne in mind if the road problem is to be solved successfully. Portland cement concrete will not make a very digestible Christmas fruit cake (as some cement promoters seem to want us to believe), nor will vitrified pavers, rattling 10 or 12 in the "N. P. B. M. A. standard rattler with standard shot," make a very successful feather bed. Neither will "Aztec" or "Texaco" used as a light surface treatment over trap rock waterbound macadam make as durable a pavement as is required on lower Broadway, nor cement-grouted granite blocks be just the thing to use on a country road out in central Iowa.

As for a "permanent" road, it is safe to say that no such road exists. We can only approach as nearly as is possible, all things considered, to the permanent. Perhaps the term might be applied to roads built to sustain the traffic of the community at an expense which that traffic justifies, considering the material costs, wealth of the community and traffic requirements. The engineer, if a competent man, can advise his people on all these conditions. Some roads will demand, under this formula, brick or cement or asphalt or some other of the surfacing

classed as "permanent pavements." Some will come under as macadam, waterbound or treated, and miles of other roads will be built of gravel.

SAVE THE MACADAM ROADS.

The rapid increase in automobile and auto-truck traffic on the through roads in the more settled communities has relegated waterbound macadam and plain gravel roads generally to a light-traffic class. But to say that this class of road is a thing of the past ages and a waste of money is as foolish a statement as it will be for our returning thousands to advocate the general adoption of waterbound macadam for all roads because of our experiences in France. Neither course would be an intelligent one.

In the United States it is estimated that up to January 1, 1919, there were 70,000 miles of waterbound macadam and 130,000 miles of gravel roads. Some 200,000 miles of real road, built of local material! Certainly the macadam has cost not less than \$6,000 per mile to build. And the gravel has probably cost half as much or \$3,000 per mile. At these rates \$420,000,000 has been spent for macadam and \$390,000,000 for gravel. A total of more than \$800,000,000 has thus been spent for the less permanent type of road. One of the first problems is how to save this expenditure, for most of these earlier built roads are the main highways. Millions of dollars has also been added to this original \$800,000,000 for maintenance. Many of the gravel and macadam roads are now very old and have been constantly used for years, some for generations. Shall these be thrown away by digging up and replacing with what is known as a "hard surface road?" Experience has shown that these roads can be treated at comparatively small expense per annum and actually made permanent roads so far as permanence goes in road building.

The cost of tearing up and replacing these macadam roads with any new pavement would certainly, at present prices, not be less than \$35,000 per mile for an 18 ft. metal surface. Treatments such as have been so successfully used in many parts of the country for the past few years have proven the advisability of saving what has already been spent. With the highest quality of bituminous binder, certainly the best kind of surface treatment can be applied for not to exceed \$5,000 per mile, while subsequent treatments would not, for maintenance purposes, reach \$1,000 per mile per annum.

The difference in first costs would be say \$30,000. Interest at 4 per cent on \$30,000 (not allowing for any sinking fund) would be \$1,200. It is therefore safe to guarantee that for less than the annual interest on the mere difference in first costs between the heavier so-called permanent surfaces and a good penetration surface treatment, the great majority of all gravel and macadam roads now built can be surfaced and maintained.

No fault is to be found with the so-called permanent pavements mentioned and many others, as they are excellent pavements when well built. But there are times and occasions when the community cannot afford to consider them. And many thousands of miles of our old gravel and macadam roads are included in those which should be maintained at far less a cost than such an expensive rebuilding would entail on the community. Great caution, however, must be used in determining which conditions will warrant the greater expense and which will permit of the lighter expense. The asphalt salesman or the cement salesman is not the ideal man to advise the community on this point. Nor is the contractor who has submitted a low bid on concrete, on brick or on sheet asphalt or the firm who wants to surface with a

light treatment. Equally poor an advisor is the property owner who has allowed his opinions of the various pavements to be formed by paving promoters. The State Highway Departments all should have engineers of character, reputation and experience, and the better class of experienced local engineers and the really experienced county engineers are men equipped to advise on these matters and they should be listened to as they give their "reasons why."

There is no suggestion, in France, of replacing their splendid macadam roads with expensive pavements. Much bituminous surfacing has already been done. After peace conditions, much more will be done. Even now the engineers are planning for such work. But they will continue to build macadam roads in France just as we will so continue in America. Waterbound macadam and gravel roads will continue to be built and continue to be used. There are thousands of miles where no higher type of road is necessary or may ever be necessary. So, too, there are thousands of miles where brick surfaces are needed and will be built; millions of barrels of cement will be needed for good concrete roads; hundreds of thousands of tons of asphalt will in the next few years be made up into the various asphaltic surfaces. All these are good and are badly needed. But it should be borne in mind that millions upon millions of dollars can be saved to the already heavily taxed property owner by preserving the old macadam and gravel by intelligent treatment. And to say that all improved roads of the future must be of one kind costing \$30,000 to \$50,000 per mile shows a deranged mind, to say the least.

There is no question but that thousands of miles of gravel and macadam must be taken care of. Intensive automobile traffic is too much for untreated roads of this character. But the engineer owes it to his community to give it the best possible results with a minimum expenditure looking toward permanency. France is a frugal nation. She has built macadam because she needed roads, because rock was plentiful and because they were the cheapest first-class roads at the time which entirely filled the bill for the French. But auto traffic has changed conditions and France is now confronted with the necessity of changing her methods of construction on the heavy traffic highways. Her engineers are studying the questions and adopting new methods. But these engineers contemplate using for the maximum advantage to France the macadam roads already so well built and so beneficial. America is not different from France except that we think less of the original cost of what is to be torn up. We often overlook the advantage to be gained in utilization rather than destruction. This has reached the point where the destruction has become wanton waste. Eight hundred millions of dollars is a big sum of money to dig up and throw away when there is a satisfactory way of utilizing the largest part of the expended millions. Then, too, millions of dollars will annually continue to be spent, and rightly spent, in building macadam roads. And even though waterbound macadam is sufficient for all purposes now, in a few years increasing traffic may require a more permanent surface. Then the macadam may be built upon, not thrown away. Macadam, waterbound, is not the ideal pavement but it will continue to be used because it is cheap; because it can be easily and quickly built and because in many instances it answers every purpose.

So, sane and sensible engineers, let us use modern methods and build good macadam roads, waterbound or bituminous bound, where these roads will answer every purpose. Where traffic requires a better and more expensive road, let us figure costs "and everything" and build accordingly. And instead of throwing away the

value of the money already spent, let us utilize as foundations the macadam and gravel we already have. Upon such foundation can be built the character of road necessary to sustain the new traffic. The permanent road has not yet been found. In a few years more we may be called upon to tear up again the "permanent" roads we are building today. We have had to learn from the Frenchmen what are actual road systems and what they mean to a country in peace and in war. And we have learned that well built waterbound macadam and gravel roads may be depended upon, if cared for, to sustain even the most intense traffic for long periods. But with our modern machinery and equipment and our excellent bituminous cements, we have nothing to learn from them as to methods of treatment and preservation. STOP, LOOK, LISTEN! Then use common sense, good judgment and engineering knowledge and experience, either your own or your fellow engineer's

STATION FOR DISPOSING OF NIGHT SOIL

Latest Practice of Public Health Service as Employed at Montgomery—Method and Cost of Operating Station.

While a sewerage system—water-carriage—is unquestionably the most sanitary and least objectionable way so far devised for removing human excrement from dwellings, there are always some buildings on the outskirts of cities which are not yet served by sewers; and there are in many cities quite thickly populated sections which are not sewered, though, of course, they should be.

Consideration of the health of the citizens demands that as sanitary a substitute for sewerage as is practicable be operated until the sewers are provided. It seems to be generally agreed that the can system, properly operated, is the best of such substitutes. The proper operation includes disposal as well as collection. How one such system was carried out was described in our issue of April 26, 1919.

A station for disposing of can-collected excrement at Montgomery, Ala., designed by E. B. Johnson, chief sanitary inspector of the U. S. Public Health Service at that city, represents the latest practice of that bureau.

First of importance comes the location of the station, for there will be some objectionable odors which will certainly become a source of complaint on the part of persons residing in the vicinity.

Of equal importance is the proper equipment and management. If the building and the persons of the attendants are not kept clean, it will be difficult to retain the necessary operators.

At Montgomery, a plot of ground 150 feet by 100 feet, located on a bluff overlooking the Alabama river, was selected. The nearest dwellings are approximately 300 feet distant, and there are not more than 20 houses within 700 feet of the station. There are, however, 3,300 privies, in which 3,900 cans are used, within a radius of a mile and a half. By locating the disposal station in the center of the available plot, free ventilation has been secured and a reasonable zone maintained between it and adjoining property.

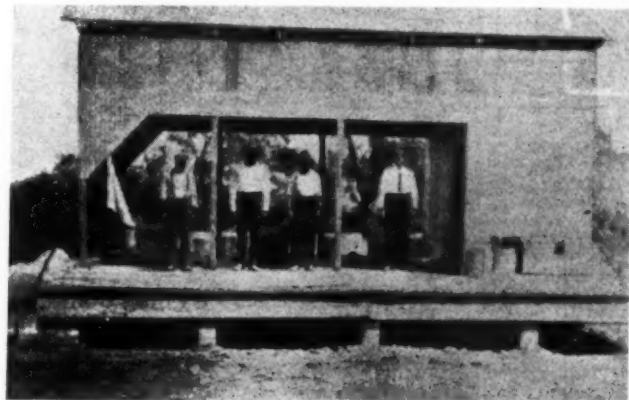
The chief consideration determining the size of the station was the platform room necessary to accommodate the incoming cans. It was estimated that 4,200 weekly (or 700 daily) would be brought through this station, and the assumption was made that not over 200 of these would arrive at one time. To allow for subsequent expansion of the system, however, all further estimates were based on a possibility of 480 arriving at one time;

so that the station has really a potential capacity of over 10,000 weekly. Since the cans are changed once a week, the station could dispose of the excreta from a territory containing 10,000 cans, or could serve a number of houses approximately two and one-half times that in the present allotted territory.

In order to provide space for the 480 cans which might possibly be unloaded at one time, it was decided to build an unloading platform 30 feet by 7 feet, and on the opposite side of the station a loading platform of the same size. Each of these platforms was designed to hold 480 cans in stacks four tiers high. To provide sufficient room in which to work around the hoppers, a space 6 feet wide, running the entire length of the building, was allowed for them between the two platforms. Thus the entire station, when completed, was 30 feet long by 20 feet wide. The cut on page 86 shows a floor plan of the station and an end elevation.

The station was built on brick pillars which were placed 5 feet apart and which were of sufficient height to bring the floor from $2\frac{1}{2}$ to 3 feet higher than the driveway. This permits the easy handling of the cans between the wagons and the platforms. The stringers were 4-inch by 6-inch timbers, and the flooring was made of 2-inch boards. The building proper is 12 feet high at the ridge and 9 feet at the eaves. Corrugated galvanized sheeting was used.

As originally designed, only the central portion of the station, 6 feet in width, was covered by a roof. In building, this plan was adhered to for the purpose of obtaining thorough ventilation and ample light. Experience has shown, however, that a better plan would be to extend the roof over the entire platform and inclose the sides with sliding or rolling doors. The attendants need shelter in stormy weather and the station equipment should be protected against theft and depredation. Also, it is proposed in future stations to provide a concrete floor with a center drain. A roadbed of cinders was laid from the street to and around the station.



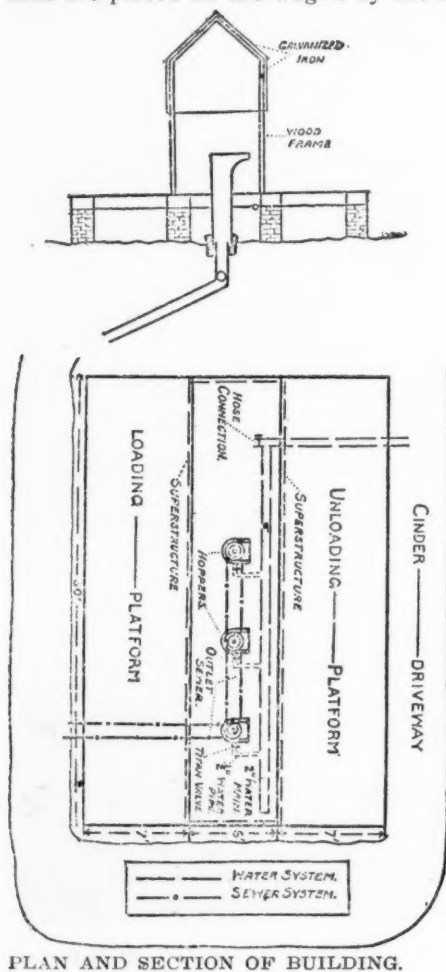
TWO VIEWS OF BUILDING FOR DISPOSING OF NIGHT SOIL

The most important and interesting feature of this station is the means by which the excrement is removed from the cans. Three concrete hoppers are used, each of which has the shape of an inverted frustum of a cone with a lip extending 12 inches toward the unloading platform. The lip is U-shaped and the lowest part of the inside is about 7 inches below the top of the hopper. On the inner wall of the hopper, and level with the inside bottom of the lip just described, 4 pieces of right-angle iron are placed at equidistant points. One side of each angle iron is fastened to the inner concrete wall by bolts, while the other side projects 3 inches into the interior of the hopper, thus forming projections which support an inverted can. The diameter of the hopper at this point is 17 inches, while the can is 15 inches diameter at the top. The concrete hopper narrows down gradually until it connects with an 8-inch sewer, which discharges directly into the Alabama river.

For washing the cans, a half-inch pipe projects into the hopper and rises vertically to a point 2 inches above the angle-iron supports. The flow from this pipe is controlled by a titan valve located just outside the hopper. Ordinarily this valve is kept closed by a spring, but is opened by moving a lever and is kept open during the operation of washing either by foot pressure of the operator or by a weight placed on the lever. The washing pipe is connected to a 2-inch pipe fed by the city mains.

OPERATION OF STATIONS.

On bringing a load of used cans to the disposal station, each wagon is driven alongside the unloading platform, where the work of unloading is performed by the driver of the wagon and his two helpers. After the cans have been unloaded, the wagon is driven around to the opposite or loading platform, where the same number of clean cans are placed on the wagon by the same employees.



PLAN AND SECTION OF BUILDING.



TWO VIEWS OF HOPPER.

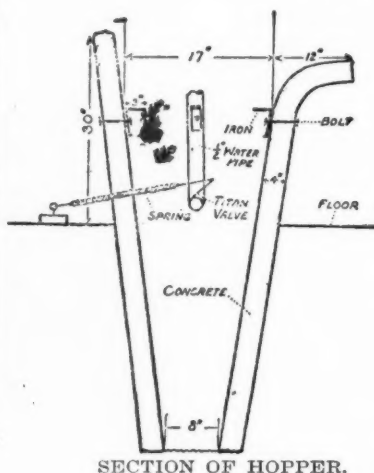
The actual handling and cleaning of the cans at the hoppers is performed by two station employees who operate under the direction of a foreman. One man operates on the "soiled can" side placing the cans in the hoppers, while the other, operating on the opposite side, removes and places them on the "clean can" platform. The man handling the soiled cans loosens the lid, which is dropped onto the platform topside down, and lifts the can to the lip of the hopper. It is then quickly inverted over the washing pipe and the greater portion of the contents falls into the hopper. The can now being in position for washing, the valve is opened and the half-inch stream of water turned on. The water is allowed to flow for from 40 to 60 seconds, after which time it is shut off by the operator on the loading side and the can removed. In practically every instance a single operation cleans the cans satisfactorily, since only in about 1 per cent of the cases do feces adhere to the inner surface after the washing. In such cases this material is loosened by applying a solution of lye by means of a mop. Despite certain apprehensions regarding the possible deleterious action of the lye upon the galvanized surfaces it has been found that no damage has resulted.

A measure not in use at this station, but which has been employed quite generally, is that of immersing the cans, after mechanical cleaning, in a tank of disinfectant solution (such as 1-50 compound cresol solution) leaving about a pint of the solution in the can.

The covers previously upturned on the platform are washed by directing upon them a stream from an ordinary hose.

The comparatively slight odor prevailing at the disposal station, even during the unloading and the cleaning operations, has been a matter for much favorable comment. This is due to the fact that all dirty cans are kept tightly covered until they are ready to be placed into the washing hopper. Then, too, the rapidity with which they are handled and the thoroughness of the washing contribute to this favorable result. The process is greatly simplified by the fact that the outer surfaces of the cans seldom become soiled.

The disposal station was erected during the war, at a time when the cost of labor and materials was unusually high. Even so, it does not appear that the expense of construction and maintenance has been disproportionate to the success which has attended the project. The items of expense connected with the erection and operation of the main disposal station may be briefly summarized as follows:



SECTION OF HOPPER.

Cost of construction:

Ground	\$1,500.00
Station and hoppers	768.40
Sewer, water pipes, and fixtures.....	931.60
Total.....	3,200.00

Cost of operation (daily):

Foreman	4.50
2 laborers, at \$2.50	5.00
Total.....	\$9.50

This force handles 700 cans daily, and it could, if necessary, care for 1,200 cans in the same time.

The disposal station has been in continuous operation in Montgomery for more than six months. In that time a large number of service cans have been cleaned expeditiously and with practically no objection from persons either working at the station or residing in the neighborhood. From a mechanical as well as from a sanitary standpoint, in which it is an important factor in the prevention of disease, the station has come to be regarded by the community as a successful part of an important system.

ST. PAUL'S STREET CLEANING AND WASTE DISPOSAL.

Increase in Costs Last Year Over Those of the Year Before.

The work of the Bureau of Sanitation of the Department of Public Works of St. Paul during the year 1918 was quite similar in most respects to that during the year 1917 (which was described in our issue of September 28, 1918) except for the costs and prices, and it is interesting to compare these for the two years.

The salary of the inspector of street cleaning, who has charge of this work, has been raised from \$100 a month to \$115. Teams were paid 75 cents per hour instead of 66 2-3 cents, and shovelers received 27 cents instead of 25 cents.

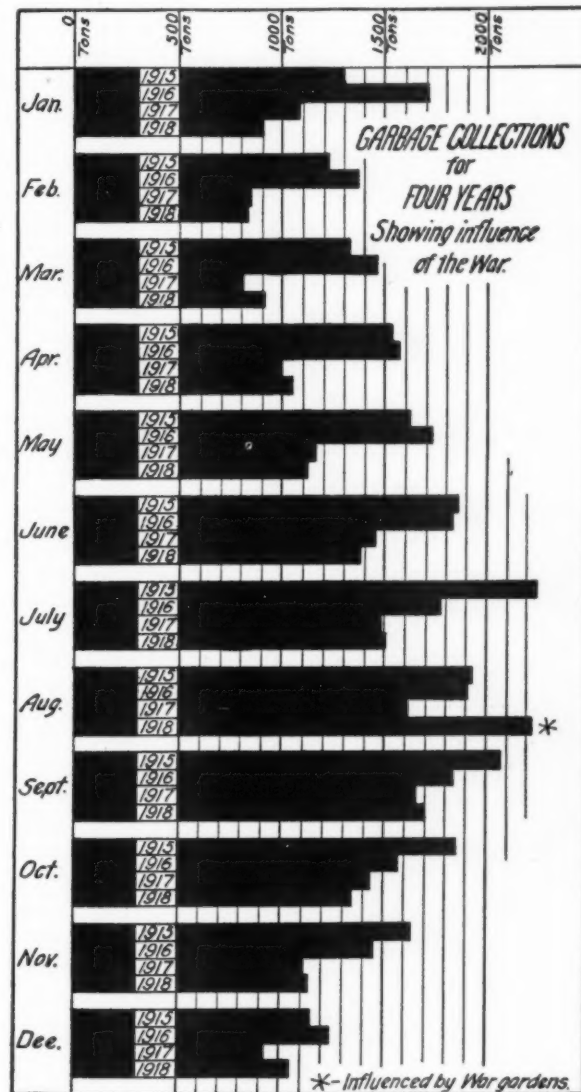
The streets in the business section continued to be flushed by three horse-drawn flushers, the cost of operating each flusher for one night being given as \$12.07 in 1917 and \$11.52 in 1918, and the cost per thousand square yards having averaged 24.7 cents in 1917 and 23.6 cents in 1918, this including in both cases the pay-roll, oil, waste, gasoline and water, and in 1917 the repairs to equipment, but not including such repairs in 1918, this probably accounting for the lower cost in 1918.

In 1917 five squeegees were used on the smooth pavements, and this number was increased to seven in 1918. The average cost of squeegeeing the streets in the business district averaged 15.5 cents in 1917 and 19.4 cents in 1918, and the average costs in the residence district averaged 27.7 cents and 34.6 cents respectively, each being the cost per thousand square yards for one scrubbing.

As in 1917, the city's garbage was collected in 1918 by thirty city teams and fifty licensed garbage collectors. In 1918 the city paid \$130 a month for teams as compared to \$100 in 1917. One of the garbage farms to which the city delivered garbage paid 75 cents a load for the garbage up to September 1, 1918, and another paid \$1.38 per load after that date for garbage from the same district. Garbage from another district had been sold at \$1.00 per ton prior to September 1st, the same company paying \$3.02 after that date. The third district received an increase from \$1.00 a ton to \$3.27 per ton at the same date.

The amount of garbage collected by city teams in 1917 was 5,414 tons and in 1918, 5,728 tons; and that collected

by private collectors was 8,760 in 1917 and 9,432 in 1918. In spite of the increase, the collection in 1918 was much less than in 1916, when the amounts were 7,215 tons and 12,000 tons respectively. The amount of garbage collected during each of the months of the years 1915 to 1918 inclusive are shown on the accompanying diagrams.



GARBAGE COLLECTIONS IN ST. PAUL

The receipts from hides and dead animals in 1918 was only \$1,227 as compared to \$2,172 in 1917. The receipts from garbage collected and from license fees in 1918 totaled \$11,397, as compared to \$5,183 in 1917.

Cleaning catch basins is all done by two crews, each consisting of a foreman and sixteen men, using eight 2-wheeled, 1-horse dump carts, two small derricks and windlasses and the necessary buckets. There are 8,650 catch basins in the city, and these are cleaned out "usually twice a year."

Sewer flushing is done by a crew of five men and a foreman, using 2½-inch fire hose with a ½-inch nozzle. Water used in flushing is paid for on the basis of 40 cents an hour for the time the hydrants are open, it being estimated from tests that this approximates three cents per hundred cubic feet. In 1918, 40,339 feet of sewer were cleaned in this way, using 5,705,000 gallons of water. The sand-rock sewer tunnels, of which there are thirty-one miles, are cleaned and repaired in the winter time when the flow in the sewer is low and uniform. The winter temperature in these sewers is about 60 degrees.

WATER RATES AND FIRE PROTECTION CHARGES

Data from Several Hundred Cities of the United States—Maximum and Minimum Rates—Changes Since Before the War—Receipts for Public Hydrants and Private Fire Protection.

HYDRANT RENTAL.

Inquiries are frequently sent to this office concerning the hydrant rental charged in the different cities of the country by both municipal and private plants, and in order to obtain information on this subject, we included

it in the questionnaire sent to water works officials a few weeks ago. The replies are given in the tabulated matter relative to meter rates and fire protection charges which are appearing in several consecutive numbers of Municipal Journal and Public Works. We have summarized

METER RATES AND FIRE PROTECTION (Continued).

City and State.	Municipal or Private.	Rate.	Maximum Meter Rates For consumption less than	Minimum Meter Rates.
Montana:				
Billings	Municipal	25c per 100 cu. ft.	7,500 per month	5c per 100 cu. ft.
Kallispell	Municipal	40c	10,001 per month	7½c
Libby	Private			
Livingston	Private	37½c per 100 cu. ft.	401 cu. ft.	9c per 100 cu. ft.
Nebraska:				
Aurora	Municipal	\$1.25 per M	1,001 and services per quarter	15c per M
Columbus	Municipal	20c per M	250,001 per month	10c per M
Hastings	Municipal	18c	8,001	8c
Lincoln	Municipal	15c per M straight		
North Platte	Municipal	18c per M	10,001	5c per M
Schuyler	Municipal	20c per 100 cu. ft.	1,001	
New Hampshire:				
Berlin	Private	30c per 100 cu. ft.	1,500 cu. ft. per quarter	10c per 100 cu. ft.
Claremont	Municipal	15c per 100 cu. ft.	3,001 cu. ft. per month	7½c per 100 cu. ft.
Concord	Municipal	22.2c per M	1,001 per day	5c per M
Lebanon	Municipal	25c per M	10,001	12½c per M
Nashua	Private	15c per 100 cu. ft.	10,001 cu. ft. for quarter	3½c per 100 cu. ft.
Newport	Private	40c per M	30,000	13½c per M
Portsmouth	Municipal	30c per 100 cu. ft.	6,001 cu. ft. per quarter	20c per 100 cu. ft.
New Jersey:				
Atlantic City	Municipal	12c per M straight		
Bordentown	Municipal	30c per M	50,001	8½c per M
Bridgeton	Municipal	25c per M	101 per day	10c per M
Camden	Municipal	30c per 100 cu. ft.	666 cu. ft.	11c per 100 cu. ft.
Garfield	Municipal	\$12 per year	780,000	
Hammonton	Municipal	11½c per 100 cu. ft.		
Harrison	Municipal	20c per 100 cu. ft.	6,001 cu. ft. per quarter	4c per 100 cu. ft.
Hawthorne	Municipal	17c per 100 cu. ft.	10,001 cu. ft. per quarter	8½c per 100 cu. ft.
Irvington	Private	40c per M	30,000	
Jamesburg	Private	25c per M	1,001 per day	9c per M
Milltown	Municipal	25c per M	25,001 pr quarter	4c per M
Newton	Municipal	25c per M	1,200 cu. ft.	
Nutley	Municipal	31½c per 100 cu. ft.	50,000	12c per M
Pleasantville	Private	35c per M	1,001 cu. ft.	4c per 100 cu. ft.
Ramsey	Municipal	15c per 100 cu. ft.		
Weehawken, Camp Merritt & 45 municipalities.	Private			
New York:				
Albany	Municipal	9 1-3c per M	375,000 per day	4c per M
Amsterdam	Municipal	20c per 100 cu. ft.	25,000 cu. ft.	
Beacon	Municipal	25c per 100 cu. ft.	5,001 cu. ft.	7½c per 100 cu. ft.
Canandaigua	Municipal	6c per 100 cu. ft.	Straight	
Corning	Municipal	28c per M	10,001 per quarter	7c per M
Danville	Municipal			
Elmira	Municipal	30c per 100 cu. ft.	10,000 gal. per quarter	5c per 100 cu. ft.
Frankfort	Municipal	21.2c per 100 cu. ft.	1,166 cu. ft. per quarter	5.45c per 100 cu. ft.
Fredonia	Municipal	17c per M	20,000 per year	4c per M
Gloversville	Municipal	12c per 100 cu. ft.	5,001 cu. ft. per 6 months	3½c per 100 cu. ft.
Herkimer	Municipal	10c per M straight		
Hudson	Municipal	8c per M		5c per M
Little Falls	Municipal	14c per 100 cu. ft.	2,001 cu. ft. per quarter	3c per 100 cu. ft.
Mechanicsville	Municipal	20c per M	1,001 per day	5½c per M
Middletown	Municipal	12½c per 100 cu. ft.	3,200 cu. ft.	4c per 100 cu. ft.
Mount Morris	Municipal	20c per M	150,000 per 6 months	8c per M
Mount Vernon	Private	30c per 100 cu. ft.	3,126 cu. ft.	10c per 100 cu. ft.
Newark	Municipal	30c	20,001	10c
Niagara Falls	Municipal	8c per 100 cu. ft.	20,001 cu. ft. per quarter	3c per 100 cu. ft.
North Tarrytown & 6 other municipalities....	Private	28c per 100 cu. ft. for low service district; 35c per 100 cu. ft. for higher service district	40,001 cu. ft. per year	17½c per 100 cu. ft. for low service district; 23c per 100 cu. ft. for high service district
Norwich	Private	27½c per 100 cu. ft.	1,001 cu. ft.	3c per 100 cu. ft.
Ogdensburg	Municipal	10c per M		
Olean	Municipal	30c	50,001 per month	5c
Owego	Private	15c per 100 cu. ft.	301 cu. ft. daily	7c per 100 cu. ft.
Peekskill	Private	16c per M	1,000,000 per day	3c per M
Port Jervis	Municipal			
Potsdam	Municipal	20c per M	37,500 per quarter	10.7 per M
Poughkeepsie	Municipal	20c per M	7,001	2c per M
Rome	Municipal	20c per M	30,001	12c per M
Solvay	Municipal	5c per 100 cu. ft.	10,001	4c per 100 cu. ft.
Schenectady	Private	20c per 100 cu. ft.	1,001 cu. ft.	10c per 100 cu. ft.
Seneca Falls	Private			
Sidney	Municipal	11c	45,000 per month	4½c
Syracuse	Municipal	30c per 100 cu. ft.	4,001 cu. ft.	11c per 100 cu. ft.
Tarrytown	Municipal	11c	1,001 per day	2½c
Tonawanda	Municipal	5c flat		
Troy	Municipal	30c. per 100 cu. ft.	1,001 cu. ft. per quarter	5c. per M
Waverly	Municipal	23c. per 100 cu. ft.	1,501 cu. ft.	7½c. per 100 cu. ft.
Wellsville				
North Carolina:				
Concord	Municipal	31c. per M	25,001 per quarter	8c. per M
Henderson	Private	40c.	30,001	
Monroe	Municipal	50c. per M		
Statesville	Municipal	35c. per M		15c. per M
Wilmington	Municipal	15c. per 100 ft.	2,001 cu. ft.	8c. per 100 cu. ft.
North Dakota:				
Fargo	Municipal	10c. per M	Flat rate per 6 months	
Wahpeton	Municipal	23c. per M	5,001 per day	10c. per M

METER RATES AND FIRE PROTECTION (Continued).

City and State.	Minimum Meter Rates For consumption more than	Increase since before the war.	City pays for fire hydrants.	Charge for private hydrants or sprinklers.
Montana:				
Billings	1,500,000 per month	None	\$40 each per year	2" line—\$20 per year; 4"—\$36 6"—\$40
Kalispell	500,000 per month	None	\$40 each per year	No charge
Libby .....	.....	None	\$60 each per year	.....
Livingston	50,000 cu. ft.	None	Nothing	.....
Nebraska:				
Aurora	25,000 per quarter	None	Nothing	.....
Columbus	250,000 per month	None	Nothing	None
Hastings	10,000,000	12%	\$9 each per year	None
Lincoln .....	.....	None	Nothing	\$18 per year private hydrant
North Platte	1,000,000	20%	\$60 per year, \$1,000 for flushing sewers	\$2 per sprinkler head
Schuyler .....	.....	(e)	\$1,000 per year for 55 hydrants	None
New Hampshire:				
Berlin	60,000 cu. ft. per quarter	None	\$40 each per year	None
Claremont	5,000 cu. ft. per month	None	\$30 each per year	\$25 per year per hydrant
Concord	300,000 per day	None	Nothing	Hydrants \$30 each, sprinklers 7½c. each per year
Lebanon	20,000	None	Nothing	None
Nashua	1,250,000 cu. ft. per quarter	None	\$30 per year	None
Newport	1,000 per day	None	Nothing	None
Portsmouth	6,000 cu. ft. per quarter	5c. per 100 cu. ft.	\$40 per year	Metered
New Jersey:				
Atlantic City .....	.....	None	Nothing	None
Bordentown	1,150,000	None	Nothing	\$100 per year
Bridgeton .....	.....	.....	Nothing	None
Camden	10,000 per day	Maximum from 20c. to 25c. & so on	Nothing	.....
Garfield	1,000 cu. ft.	None	\$30 per year	\$30 for hydrants & 25c. for each sprinkler head
Hammonton .....	.....	None	Nothing	None
Harrison .....	.....	None	Nothing	Meter by Hersey detector meter
Hawthorne	20,000 cu. ft. per quarter	None	\$25 per year	50c. per quarter
Irvington	1,000,000 cu. ft. per quarter	.....	\$6 & \$8 each per year	Metered
Jamesburg .....	.....	None	\$17.50 per year	None
Milltown	100,000 per day	None	Nothing as yet	Have none
Newton	6,000,000 per quarter	None	Nothing	.....
Nutley .....	.....	None	Nothing	None
Pleasantville	100,000	Awaiting decision	\$25 each	Only 1 sprinkler; \$317 per year plus water used
Rahway	5,000 cu. ft.	None	\$500 per year maintenance	None
Weehawken, Camp Mer- ritt & 45 municipalities.	.....	Slightly lowered; appli- cation for 20% increase	.....	.....
New York:				
Albany	375,000 per day	From 8c. to 9½c.	Nothing	None
Amsterdam .....	.....	None	Nothing	None for private hydrants, 4c. ft. sprinkling
Beacon	500,000 cu. ft. per quarter	None	\$2,000 per year for 177 hydrants	None
Canandaigua .....	.....	None	Nothing	Metered
Corning	1,000,000 per quarter	None	\$9.14 each	\$15 per year
Danville .....	.....	.....	Nothing	None
Elmira	7,500,000 gal. per quarter	None	\$12,000	None
Frankfort	116,666 cu. ft. per quarter	None	Nothing	None
Fredonia	3,000,000	None	Nothing	\$3 per year for sprinklers
Gloversville	25,000 cu. ft.	None	Nothing	None
Herkimer .....	.....	Proposed	Nothing	None
Hudson .....	.....	None	Nothing	\$5 per year
Little Falls	12,000 cu. ft. per quarter	Maximum rate lowered, Provision in charter for minimum raised	\$6,500 per year—not paid recently	None
Mechanicsville	20,000 per day	None	Nothing	None
Middletown	30,000 cu. ft.	None	Nothing	\$2.50 per year
Mount Morris	6,000,000 per 6 months	None	Nothing	None
Mount Vernon	100,000 cu. ft.	Probably June 1st, 1919	\$40 each per year	Hydrants \$40 each per year; sprinkler heads 10c. each
Newark	50,000	25%	Nothing	\$5 per year flat rate
Niagara Falls	250,000 cu. ft. per quarter	None	\$35 each	None
North Tarrytown & 6 other municipalities.	1,000,000 cu. ft. per year	.....	\$7 each per year in addition to inch-foot charge	\$7 per hydrant per year; sprink- lers, 2"—\$24 to 8"—\$254 per quarter
Norwich	80,000 cu. ft.	50c. on minimum meter rate per quarter	\$23.40 (33 hydrants being installed)	None
Ogdensburg .....	.....	None	None, sorry to say	\$40-\$80 per year
Olean .....	.....	25% account of filtration plant put into operation	\$20 each per year	.....
Owego .....	.....	None	\$40 each	.....
Peekskill	20,000 cu. ft. daily	50%	Nothing	Meter rates
Port Jervis	1,000,000 per day	None	\$16.67 each	\$15 each
Potsdam	20,000	None	Nothing	\$1 per year
Poughkeepsie	700,000	None	Nothing	None
Rome	30,000	None	Nothing	None
Solvay	10,000	None	\$40 each per year	\$40 per hydrant per year
Schenectady .....	.....	None	Nothing	\$2 per year
Seneca Falls	5,000 cu. ft.	None in meter rates	Lump sum	\$20 per year hydrant; 5c. per year sprinklers
Sidney .....	.....	30%	\$40 per year	None
Syracuse	210,150 per month	None	Nothing	None
Tarrytown	300,000 cu. ft.	None	\$40 each per year	Metered
Tonawanda	20,000 per day	None	Nothing	Meter rates
Troy .....	.....	None	Nothing	None
Waverly	1,500,000 gal per month.	None	\$2,000 per year	None
Wellsville	20,000 cu. ft.	20c to 23c minimum; 62-3 to 7½c maxi- mum; further in- crease proposed	\$5,000 per year	Sprinkler, 10c per head; mini- mum, \$50 per year
North Carolina:				
Concord	2,000,000 per quarter	None	Nothing	\$40 per hydrant
Henderson .....	.....	25% in 1917	\$40 for first 68; \$35 for additional	\$40 per year; \$4 per 1,000 sq. ft.
Monroe .....	.....	None	Nothing	None
Statesville .....	.....	33½%	No credit given	.....
Wilmington	50,000 cu. ft. per quar.	25%	\$40 each per year	Valuation of property basis
North Dakota:				
Fargo .....	.....	Decreased	\$20 per year, hydrant, sprinkling and flush- ing; \$36, fire pro- tection; \$5, con- struction uses	Meter rates
Wahpeton	3,000 per day	None	Nothing	Have none

(e) Slight increase in all bills below \$3.45; all over that less.

the figures given, including that part of the table which has not yet appeared, and give the results below.

About four hundred cities replied to the question, although several of them have a method of charging for fire hydrants which could not be readily tabulated. Among these are Stockton, Cal., where a private plant charges \$12 per hydrant per year, but the city owns the hydrants. In Putnam, Conn., the city pays for all water used through hydrants. In Burlington, Ia., a private plant, a 5-mill tax on all property in the water district is paid to the company for fire protection. In Muscatine, Ia., the city pays the interest on water bonds, which is assumed to serve as reimbursement for the fire protection. Marysville, Ky., paid the company \$65,000 for perpetual protection. Traverse City, Mich., pays the municipal plant \$35 per year per hydrant and also \$300 a year for the use of the hydrants for street sprinkling. In Chisholm, Minn., \$1 per capita per year is turned over to the department as payment for fire protection. In North Platte, Neb., the water department receives \$60 per hydrant and \$1,000 for flushing sewers. The company serving North Tarrytown, N. Y., and six other municipalities receives \$7 per hydrant per year in addition to a charge based on the inch-foot of mains in service. Fargo, N. D., pays the department \$20 per hydrant for use in sprinkling and flushing, \$36 for fire protection and \$5 for construction uses. Beaver Falls, Pa., pays the private company for fire protection \$400 per mile of main and \$7 for each fire hydrant. Chester, Pa., pays \$40 for each thousand feet of pipe. Wilksburg, Pa., pays the company \$275 per mile of main and \$3 additional for each hydrant.

(To be continued)

BOONVILLE MUNICIPAL WATER WORKS.

A short time ago we received a report of the Board of Public Works of Boonville, Mo., which contains two features of interest. One is that it gives the history of the municipal water works from the time it was purchased from the private owners in 1905 up to date, showing that it has been a profitable investment. The other is that, although the Board of Public Works has been operating this plant for fourteen years, this is the first report which it has made. During this time the personnel of the board was entirely changed, no member of the present board having served for more than seven years. With such an excellent showing as that which appears from this their first report, it seems all the more remarkable that they have not seen fit to set forth before this in a public report the activities of the board and the development of the water works.

Previous to the acquisition of the water works property in 1905, the company owning it had charged \$60 per year for each of the fifty-three fire hydrants in use. The pressure available was insufficient to give adequate protection, this in fact being one of the complaints against the service that led to the purchase by the municipality. During the negotiations the company offered to reduce this rate to \$45 per year.

Since the purchase, the city has paid all but \$4,000 of the cost of the plant, representing a gross investment of \$121,000, has set aside \$33,000 for depreciation, has accumulated approximately \$6,000 surplus, and has made all necessary additions and betterments to the plant, including increased and reserve pumping capacity, an increase in the distribution system by two-thirds, a purification plant, and an increase in the reservoir capacity and fire protection.

Meantime, the rates have been no higher than in other cities of the same size, whether under private or municipal ownership, and have been lower than in some. Of the original outstanding bonded debt, the city has retired

all but \$4,000. The tax levy by which these results were accomplished has been 35 cents per \$100 valuation.

The purchase price for the property was \$52,500, based on a valuation made by engineers employed by the city in 1903, plus expenditures by the company after that time. The property purchased included about 31,000 feet of distribution mains, 28 acres of land, pumping station and other buildings, reservoirs and a brick tower supporting a wooden tank. Of the original property, only the distribution system and land are still in service. Immediately upon acquiring the property, the city began making improvements, adding in 1905 some 15,000 feet of mains with additional fire hydrants, a mechanical filter of one million gallon capacity and a steel tower with a 70,000 gallon tank. A concrete coal shed has been added to the pumping station. The distribution system at present contains about 50,000 feet of mains, of which 78 per cent is six inches diameter or larger, and 2,100 feet is ten-inch. There are now on the distribution system ninety-four fire hydrants within the city and six (which are state property) have been installed at the Reform school, which purchases its water from the city water department. Metering is believed to be the only equitable method of charging for water, and at the end of 1918, 427 of the 703 customers were metered, and the department is using every endeavor to place the others on a metered basis.

The water is obtained from an "intake well" of "practically unlimited capacity" located on the bank of the Missouri river. A ten-inch and a fourteen-inch suction line extend from this well a distance of about fifty feet to the pumps. The pumping equipment consists of one 2,000,000-gallon and one 1,000,000-gallon steam pump, and one 125 h.p. and one 75 h.p. horizontal boiler.

The water is purified by coagulation and sedimentation in three reservoirs operated in series, the total capacity of which is about four and a half million gallons. Lime and sulphate of iron are added to the water before entering the reservoirs.

"The water department has been operated with a view towards making a minimum profit. It has been operated with a view towards supplying pure water at a minimum cost but not at a price less than cost." In 1918 the meter rates varied from nine cents per thousand gallons to thirty-five cents, with a minimum bill of seventy-five cents a month. Previous to the increased cost due to the war, the minimum rate had been eight and a half cents and the minimum payment fifty cents a month.

In addition to paying for the property and acquiring the reserve, free service has been given to the city for watering troughs, sewer and street flushing and services to the city offices, as well as fire protection, and previous to 1918 free service was given to the schools also. It is estimated that this free service was worth \$4,580 in 1918, and that the average during the fourteen years has exceeded \$3,500 a year, or totaled at least \$49,000.

STATE EXPENDITURES FOR ROADS.

The Bureau of the Census is soon to issue a report on the "Financial Statistics of States for 1918," in which it will show that the total outlay of the states for permanent improvements was \$66,207,696; and that of this amount, \$40,071,045 was spent for roads, \$21,951,415 directly by the states, and \$18,119,630 was turned over to counties, municipalities and other minor civil divisions for highway purposes.

California led with an outlay of \$5,273,845; New York was second, with \$4,059,887; followed by Maryland, \$2,150,619; Washington, \$1,907,525; Ohio, \$1,871,811; Massachusetts, \$1,815,192, and Pennsylvania, \$1,258,022. Eight states spent nothing for roads, either as outlays or as apportionments.

The WEEK'S NEWS

U. S. Bureau of Public Roads Distributes Large Army Stores to State Highway Departments—Massachusetts Studying Water Resources of State—New Jersey Utilities Commission Claims Power Over Municipal Plants—Canada Coordinates Water Power Investigations—Chicago Firemen "Strike"—Columbus Fire Department Motorized—Army Truck Convoy Pioneering Across Continent—Massachusetts to Have New Utilities Commission.

ROADS AND PAVEMENTS

Improved Type of Bridges Built by State.

Harrisburg, Pa.—State Highway Commissioner Lewis S. Sadler has announced that bids will be opened August 18 for the construction of sixty-six concrete bridges in various part of the state. The structures range in span from 8 to 36 feet. Under the present plans of the department, the danger of washouts from high water is reduced to a minimum, inasmuch as plans for all bridges now under construction or to be constructed in the future by the department call for more waterway than was the case a number of years ago. The foundations are deeper and the clear openings of the span higher and wider. The department is building no temporary structures. All are to be of heavy reinforced concrete, containing the best type of steel. One of the largest structures to be built by the department this year is that on the Lackawanna Trail near Nicholson Borough. This is a monumental structure of three spans, each 135 feet in length. The bridge is to be of reinforced concrete with pylon approach.

Federal Distribution of Highway Materials and Equipment.

Washington, D. C.—The Department of Agriculture, according to a report to Congress, is distributing through the Bureau of Public Roads, large allotments of materials and equipment from surplus war supplies no longer needed by the War Department. This equipment and material is included under general heads as follows: Motor trucks and motor cars; construction and operating equipment; construction materials; field and office equipment; camp, mess and kitchen equipment; general supplies, machine tools, woodworking tools and miscellaneous outfits, and animals. The total value of the various items under these heads is very large, the value of the motor-truck equipment alone being estimated at more than \$70,000,000. The equipment and supplies are being distributed under an act of Congress which instructed the Secretary of War to deliver surplus war materials to the Department of Agriculture to be used in the construction and maintenance of roads constructed in part or in whole by Federal aid. This material is allotted to the states on the same basis as Federal aid and represents an addition to the Federal aid given by the various appropriations. Allotments of motor vehicles are now reported by the Secretary of Agriculture to be complete. Large numbers of these trucks and other motor vehicles have already been shipped to the states concerned. A total of 20,586 trucks, 1,075 Fords and 550 other automobiles are to be distributed. Texas comes first with 1,199 trucks, 58 fords and 30 autos. New York is second with 1,021, 50 and 25 respectively. Other equipment is as follows:

Construction and Operating Equipment—The materials under the other headings are being delivered to the Department of Agriculture as rapidly as possible, and an attempt is to be made by the Secretary of War to cover the estimated needs of the various state highway departments as given to him by the Secretary of Agriculture. The estimate of construction and operating equipment includes such items as road rollers, 400; concrete mixers, 700; road graders, 600; elevating graders, 400; sprinkling wagons, 400; road oilers, 200; trailers and tractors, 3,600; dump wagons, 6,500; industrial railway dump cars, 3,500, and 1,000 miles of industrial-railway track. The total number of items included under this heading is 52.

Construction Material—Under the head of construction materials there are such items as the following: Bituminous binder, 550,000 barrels; lineal feet of prepared joint filler, 50,000; bags of portland cement, 2,110,000; tons of gravel and crushed

stone, each, 1,000,000; lineal feet of steel forms, 40,000; industrial-railroad ties, 674,000; lineal feet of cast-iron culvert pipe, from 12 to 36 in. in diameter, 56,025, and 10,000,000 lb. of TNT (trinitrotoluene). Under this heading 31 items appear.

Field and Office Equipment—Listed as field and office equipment are 40 items, among which are engineers' transits, 1,000; engineers' levels, 1,146; Abney's levels, 1,188; Universal drafting machines, 228; planimeters, 592, and 366 adding machines.

Camp Mess and Kitchen Equipment—Under the head of camp mess and kitchen equipment 11 items occur, such as tents, 17,000; army blankets, 25,100; square feet of tarpaulin, 316,000, and 460 complete outfits of mess and kitchen equipment for units of various sizes, averaging 40 men.

As general supplies there are 40 items, one of which is 63,000 shovels, and under machine tools, woodworking tools and miscellaneous outfits there are 18 items, among which are complete machine outfits, 15; complete sets of carpenters' tools and chests, 306, and 552 complete sets of blacksmiths' outfits with forges, drills and other accessories.

Court Decision Halts Street Work.

Charleston, W. Va.—Street improvements will probably be at a standstill in Charleston for the next two years, or until the next legislature meets and amends the present city charter, according to a decision handed down by the West Virginia supreme court of appeals. This decision was given in the test suit brought some time ago in Kanawha circuit court by S. F. Bonham against the city of Charleston questioning the right of the municipal authorities to assess the cost of curbing and paving intersections of a certain block of Monongalia street against owners of abutting property. He won his contention in the lower court, and now the highest court in the state upholds the circuit court decision. It is claimed that the new municipal charter enacted into law by last legislature left a loophole on the paving cost question, and property owners' attorneys were not slow to take advantage of it. The city has no fund for street paving purposes and since 1916 has been assessing the costs of such improvements against abutting property owners. New legislation or an appropriation of levy will therefore be necessary before any more streets can be improved, under the decision.

WATER SUPPLY

City Appeals Water Damage Case.

Providence, R. I.—A verdict of \$334,636, together with special findings, was returned by the jury, for the S. H. Greene & Sons Corporation against the city of Providence, in a "million-dollar" water suit in the Kent county superior court at East Greenwich. In the special findings asked for by the city of Providence the jury finds that 72,000,000 gallons of water per week is sufficient for all purposes of the Green plant, excepting water power; that the Interlaken Mills and Pawtuxet Valley Dyeing Company have a prescriptive right to discharge mill wastes into river, and that the discharge of the mill wastes from these two mills did not impair the water at the Petaconset pumping station for a public water supply. The case was the most difficult and most important of its kind ever tried before a jury in this state. It is the first of the big mill cases, so called, against the city, of which there are others to follow, with relation to taking water from the Pawtuxet river for the Kent reservoir for a public water supply. Many novel questions are raised and precedent is established. Moreover, prescriptive rights are determined which are new questions in this state. The amount is less than was antici-

pated by the plaintiff and more than was expected from the jury by the defendant. The plaintiff claimed \$1,000,000, whereas the city's attorneys argued to limit damages to \$62,000. The city has filed a motion for a new trial on the grounds that the verdict was against the law and the evidence, and that the damages awarded the plaintiff are excessive.

To Test Water Supply Legislation.

Akron, O.—The constitutionality of the bill passed by the general assembly to provide for the impounding of the water in the lakes and reservoirs contiguous to Akron to provide that city with a water supply, will be tested in the courts. One of the leading law firms in Columbus—that of former attorney-general Joseph McGhee and L. D. Johnson, former special counsel in the attorney-general's office—has been retained to bring a suit with a view to have the law knocked out. Akron citizens whose names have not been made known and labor organizations of the city, it is understood, are behind the movement for the annulment of the law. Under the law, the state impounds the water and leases it for a term of years. Bonds of \$2,000,000 are to be issued to cover the cost of the project and the rentals are to yield the money for payment of the bonds. The contention is made by those opposed to the law that the act is in violation of the constitution. The suit will be brought in the Franklin county common pleas court.

State Studying Water Supplies of Massachusetts.

Boston, Mass.—An investigation of the water-supply needs and resources of Massachusetts is to be made jointly by the State Department of Health and the Metropolitan Water and Sewerage Board, under a recent act of the legislature. The investigation is to include "all questions relating to the quantity of water to be obtained from available sources, its quality, the best methods of protecting the purity of the water, the construction, operation and maintenance of works for storing, conveying and purifying the water, the cost of the same, the damages to property, and all matters pertaining to the subject." A report is to be made to the legislature by January 5, 1921. A general organization for the study has been effected. X. H. Goodnough, chief engineer of the State Department of Health states that besides the needs of Boston and vicinity for more water, before many years consideration must be given to the water-supply problems of cities in southeastern Massachusetts, in the Merrimack and the Ipswich Valleys and in other thickly populated areas to the west and south of the present Metropolitan district.

STREET LIGHTING AND POWER

State Commission Has Power Over City Plants.

Madison, N. J.—The State Board of Public Utility Commissioners has ordered the borough officials of Madison to make a number of improvements in the municipal electric plant and system, so as to provide safe and adequate service. The city held that the commission had no power to make an inspection of the plant or to direct any betterment work. The board says: "The observance of the recommendations is resisted by the municipality on the ground that this board has no power over its electric plant because it confines its service to the municipal limits and does not serve consumers outside thereof. They fear the encroachment of powers reposed exclusively in them. The section of the law conferring the authority, however, makes it the duty of the board to see that its standards of service are maintained alike by public utilities and municipalities engaged in operating public utilities, so that the public served may be insured safe, adequate and proper service. With its experience in matters of standards of equipment and service to be maintained to thus insure safe service, and because of the expertness of its engineers in such matters, both privately and publicly owned utilities rather welcome than resent the inspection of plants, so as to receive the suggestions and recommendations of the Board and its engineers to improve their service. We

assume the municipal authorities are disposed to furnish the inhabitants of the borough the best service reasonably possible. To do this it is necessary that the things required to be done and recommended in the inspector's report should be complied with."

Commissioner Denies 55 Per Cent Increase.

Hudson, Wis.—The state railroad commission at Madison has denied the 55 per cent increase in gas rates asked by the Interstate Light & Power Company of Hudson, but granted an increase of substantially 20 per cent. The company owns the Hudson utility but buys its gas from the Northern States Power Company at Stillwater, Minn. The company petitioned for authority to increase its rates, alleging its present schedule, with a primary rate of \$1.54 per thousand cubic feet, had never brought sufficient revenue to meet operating expenses. The commission decided that while from the standpoint of cost of service the request was not unreasonable, so great an increase in a city where electric rates are unusually low, would mean such curtailment of gas consumption as to make the company's situation less favorable than at present, and what was more serious, the people of Hudson ultimately might be deprived of gas service. Also to grant no increase under the circumstances soon might result likewise. The new schedule, which will go into effect next month, is as follows: First 2,000 feet per month, \$1.75 per thousand net; next 3,000 feet per month \$1.60 per thousand net; next 5,000 feet per month, \$1.50 per thousand net; all over 10,00 feet per month, \$1.40 per thousand net.

Canadian Water Power Investigations Co-ordinated.

Toronto, Ont.—Following an order in council issued by the Canadian government steps have been taken to investigate and develop the water-power resources of Canada. The order provides for the coordination of departments and standardization of methods more particularly in respect to the investigation of power resources. It is reported that the provinces of Nova Scotia and New Brunswick have requested a renewal of the cooperative arrangement of hydrometric investigations under the direction of the Dominion Water Power Branch. Applications have been filed by the provinces of Ontario and Prince Edward Island for the inauguration of similar arrangements. The order in council authorizes agreements for this purpose and provides that such cooperative water resources and power investigations shall be under the control and management of an officer of the Department of the Interior. It then designates the superintendent of the Dominion Water Branch as Director of Water Power. Originally the Dominion Water Power Branch controlled and administered the water resources of the provinces of Manitoba, Saskatchewan, and Alberta, the Northwest Territories, and the Territory of Yukon, and by cooperative arrangements carried on the water-resources investigations in the province of British Columbia. Other provinces which controlled their own natural resources had separate organizations for investigation. In 1915 a similar arrangement was entered into with the province of Nova Scotia and in May, 1918, with the province of New Brunswick. Under the above-mentioned order in council similar agreements will be made with the provinces of Ontario and Prince Edward Island. With the exception of the province of Quebec, the water-resources investigations of Canada will be carried out in a uniform manner under the direction of the Federal Director of Water Power. The Dominion Water Power Branch is an advisory body with the special function of coordinating the development of water and fuel power and consolidating the experience, research and efforts of all the government and provincial departments concerned. It consists of the Minister of the Interior as chairman with nine permanent department officials as members representing the Department of the Interior, the Department of Public Works, the Department of Railways and Canals, the Department of External Affairs regarding International Waters, the Department of Inland Revenue, the Department of Mines, the Dominion Railway Commission, and the Hydro Electric Power Commission of Ontario.

FIRE AND POLICE

Chicago Firemen Walk Out.

Chicago, Ill.—About 250 fire department engineers and assistants went on strike recently for higher pay. The fire chief, O'Connor, announced that substitute engineers would be used. Electricians said that should substitute engineers be used they would strike. The city had declined to meet the demands of the men for higher wages. All the men who left their posts tendered their resignations to their superior officers before walking out. The five fire tugs stationed in the river were not affected. A committee of ten representatives of the men who resigned was appointed to negotiate with the finance committee of the city council for settlement.

Fire Department Practically Motorized.

Columbus, O.—The fire department of Columbus is now virtually on a motor basis through the recent action of the city board of purchase in letting a contract for ten pieces of motor equipment necessary to complete the department's motorization. The new equipment will include four 750-gallon triple combination pumpers, one 1,000-gallon double combination pumper, one 85-foot tractor-drawn hook and ladder truck, two two-wheel front-driven steamer tractors and two four-wheel truck tractors. The amount of the contract is \$103,000. This equipment will take the place of all horse-drawn appliances at present in use in the fire houses.

TRAFFIC AND TRANSPORTATION

Bill Vetoed for Municipal Ownership Beyond City.

Harrisburg, Pa.—Governor Sproul has vetoed the Stadtlander bill, passed by the last Legislature, which would have granted municipalities the right to own and operate street railway systems beyond their municipal limits. In his message accompanying the veto, Governor Sproul observed that the bill was bad in principle. The right to own and operate a railway outside its own boundaries would enable a municipality to exert powers within the boundaries of another municipality, clearly an injustice, and a condition that would lead to undesirable results, he declared.

Transcontinental Army Truck Convoy to Get Data.

Washington, D. C.—A large convoy of army motor vehicles is making a pioneer transcontinental trip to study problems of efficient highway transportation and to arouse interest in the subject. The convoy left Washington July 7 and is scheduled to reach San Francisco by Sept. 1. The route has been laid out over the Lincoln Highway in easy stages varying from about 30 to about 85 miles per day, with convenient Sunday rest periods. The caravan consists of over sixty vehicles and more than 290 officers and men. The control points on the journey are as follows: Washington, D. C.; Frederick, Md.; Chambersburg, Pa.; Bedford, Pa.; Greensburg, Pa.; East Palestine, O.; Wooster, O.; Bucyrus, O.; Delphos, O.; Fort Wayne, Ind.; South Bend, Ind.; Chicago Heights, Ill.; De Kalb, Ill.; Clinton, Ia.; Cedar Rapids, Ia.; Marshalltown, Ia.; Jefferson, Ia.; Council Bluffs, Ia.; Omaha, Neb.; Columbus, Neb.; Grand Island, Neb.; Lexington, Neb.; North Platte, Neb.; Big Springs, Neb.; Kimball, Neb.; Cheyenne, Wyo.; Laramie, Wyo.; Medicine Bow, Wyo.; Rawlins, Wyo.; Tipton Station, Wyo.; Green River, Wyo.; Fort Bridger, Wyo.; Evanston, Wyo.; Salt Lake City, Utah; Orr's Ranch, Utah; Sheridan's Ranch, Ibapah, Utah; Ely, Nev.; Eureka; Austin, Nev.; Westgate, Nev.; Fallon, Nev.; Carson, Nev.; Myers, Calif.; Placerville, Calif.; Sacramento, Calif.; Stockton, Calif.; Oakland, Calif.; San Francisco, Calif. The convoy is making good time and is everywhere being received with ovations by officials and citizens. Regional and state chairmen and other members of the organizations of the Highways Transport Committee of the United States Council of National Defense have been urged to take advantage of an invitation issued officially on behalf of C. B. Drake, Brigadier-General, General Staff Chief, Motor Transport

Corps, U. S. Army, to meet the convoy as it passes through their states, and take advantage of the opportunity to learn what is being done through it. Members of the organization who may meet the convoy are asked to see Lt. Col. Chas. W. McClure, in charge of the convoy. A letter from General Drake to the Highways Transport Committee sets forth in part what it is hoped will be accomplished through this cross-continent tour. Exhaustive and complete statistics will be made of each vehicle that participates. Records will be kept of tire performance, gasoline, oil and grease consumption, repairs, character and condition of pavements, grades traversed, and by other data that might prove of value. Photographs, still and motion, will be taken throughout the route. The statistics and data compiled from this trip will be used as a basis upon which the Motor Transport Corps eventually will establish a library of motor statistics for public distribution. The Motor Transport Corps will endeavor to establish those relations with the public, in a motor transport way, that the Bureau of Mines and the Department of Agriculture now exercise in their activities. Secretary of War Baker, in an address delivered on the occasion of the starting of the convoy, gave strong personal and official approval to the ends sought.

GOVERNMENT AND FINANCE

New Utilities Commission for Massachusetts.

Boston, Mass.—The state legislature of 1919, before ending its session, passed an act which reorganized the machinery for regulating public utilities and abolished the Gas and Electric Light Commission and the Public Service Commission. A new Department of Public Utilities has been created, with a commission of five members, to be appointed by the Governor with the consent of the Council for initial terms of one to five years and a later standard term of five years. The yearly salary of the chairman is to be \$8,000 maximum and those of the other commissioners are not to exceed \$7,000 each. All the powers and responsibilities of the two commissions now merged are carried into the new tribunal. Appeal from and enforcement of its decisions lie in the Supreme Court of the state. To facilitate its work, two commissioners may hear cases and on agreement of all parties one member may sit. Routine and administration matters may be heard by one member. It is expected that the reorganization will effect economies in administration and in rent. The salaries of the commissioners are to be paid from the tax levy and utility companies will no longer be directly assessed for these, as was formerly the case in the regulation of gas and electric companies. The consolidation of about one hundred state departments into twenty has been effected by the act.

Technical Employees Want Living Wage.

New York, N. Y.—Following a meeting of the Union of Technical Men, an appeal was issued to various city, borough and county officials, to the Board of Estimate, Public Service Commission, Board of Aldermen and the Transit Construction Commission, asking that suitable salary increases be provided for members of the union, in order that they may keep up with the high cost of living. A flat increase of \$500 in the salaries of the technical men employed by the city of New York is asked. The increase will affect about 2,500 men in the city departments. About 2,370 of these men are now receiving less than \$3,000. The appeal states that the increases would require in the neighborhood of \$1,250,000 for the city departments, of which not more than \$625,000 would probably be charged on the budget. The Transit Construction Commission would require \$330,000 additional, chargeable to rapid transit funds. The salaries of the workers, the union claims, has advanced but 5 per cent in the last four years. The technical men prepare the plan and specifications for and supervise the construction and maintenance of public works. In the union there are also members who are employed by architects, builders, contractors, etc., who are handling private construction.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading ones published in other countries, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article. Also the name and the place of publication of the periodical in which it appeared.

ROADS AND STREETS.

Costs:

Cost and Service of New York State Highways. Discussion of actual costs of improved state highways in New York and of service rendered. By G. C. Diehl, co. engr., Erie co., N. Y. 2,300 words. Good Roads, July 23, New York.

Good Roads Pay for Themselves Twice Every Year. Statistics for three roads in Los Angeles county, Cal., show large operative income from decreased haulage cost. By J. C. Veenhuyzen, supt., county road dept., Los Angeles. 1,300 words. Engineering News-Record, July 31, New York.

The Cost of a Mile of Road. Three diagrams presenting elemental facts pertaining to cost of a mile of road; transportation costs, annual cost and total cost of traffic per ton mile. From paper at Engineering and Road Builders' Congress at Mineral Wells, by G. A. Duren, state highway engr. of Texas. 3 diagrams, 1,000 words. Canadian Engineer, July 24, Toronto, Can.

Financing:

Financing of Highway Improvements. Maintenance from motor fees; direct appropriations and special assessments; bond issues becoming popular. Address before State Highway Officials, by J. E. Pennybacker, sec'y, of the Asphalt Ass'n, formerly of U. S. Bureau of Public Roads. 2,800 words. Canadian Engineer, July 10, Toronto, Can.

Road Tax on Gasoline. Letter from C. A. Mullen, director of Paving Dept., Milton Hersey Co., Ltd., Montreal, Can., suggesting a tax on gasoline used in motor vehicles as an equitable means of raising funds for roads. 300 words. Municipal Journal and Public Works, July 26, New York.

The New State Road Law of Iowa. Measure enacted by 1919 legislature provides for improvement of 6,000-mile system of primary highways. 2,300 words. Good Roads, July 16, New York.

Concrete:

Charted Summary of State Concrete Road Specifications. Information arranged for quick determination of main features; explanation of and comments on chart. By A. N. Johnson, consulting highway engr., Portland Cement Ass'n, Chicago. 1 table, 1,500 words. Engineering News-Record, July 24, New York.

Constructing Concrete Pavements. Standard practice as recommended by the Mississippi Valley Association of State Highway Departments; materials and construction. 2,800 words. Municipal Journal and Public Works, July 12, New York.

Thickness of Concrete Slabs for Highway Surfaces. Maximum loads, condition of subsoils, and impact are all factors; experiments indicate latter is very important. 3 illus., 2,100 words. Engineering News-Record, July 31, New York.

Constructing Concrete Road near Norfolk. Up-to-date machinery and methods employed; central mixing plant and distribution of concrete by trucks; time study of mixing and distribution; mechanical finisher used; cost figures. By W. A. Hardenbergh. 1 ill., 2,200 words. Municipal Journal and Public Works, July 5, New York.

The Organization of Efficient Concrete Road Construction Gangs. By Hulbert P. Gillette, editor. 2,300 words. Engineering and Contracting, July 2, Chicago, Ill.

Suggestions for the Construction of Concrete Pavements. Reprinted from article by Clyde E. Learned, highway engineer, U. S. Bureau of Public Roads in "Public Roads." 3 illus., 2,400 words. Engineering and Contracting, July 2, Chicago, Ill.

Bituminous:

The Asphalt Industry in 1918. Value of all products and amount sold for highway work exceed records of past years. 1 table, 400 words. Good Roads, July 30, New York.

Tar containers. Some container should be adopted that would prevent waste and facilitate getting tar into heater. 100 words. Municipal Journal and Public Works, July 19, New York.

The Application Method of Using Road Asphaltum. Used to best advantage on residential streets and on county and state highways which are not main arteries of travel. 500 words. Pacific Municipalities, July, San Francisco, Cal.

How to Obtain Best Results in Constructing One-Course Bituminous Macadam. Practical details. Reprint of article by F. C. Pillsbury, division engineer, Massachusetts Highway Commission in "Public Roads." 4,000 words. Engineering and Contracting, July 2, Chicago, Ill.

Brick:

Tests of Thin-Base Monolithic-Brick Road. Proved a success by recent investigation in Illinois. By Harlan H. Edwards, highway engr., Urbana, Ill. 1 ill., 600 words. Engineering News-Record, July 17, New York.

Review of Recent Progress in Brick Pavement Design and Construction. By C. E. Mandigo, consulting engr., Western Paving Brick Mfrs. Ass'n, Kansas City, Mo. 2 illus., 2,300 words. Municipal and County Engineering, July, Indianapolis, Ind.

Other Kinds:

Design and Construction of Granite Block Pavements in Cincinnati. By H. F. Shipley, ass't city engr. in charge of highways, Cincinnati. 6 illus., 2,400 words. Municipal and County Engineering, July, Indianapolis, Ind.

Asphalt-Covered Napped-Block Pavement. A pavement being laid in Newark, N. J., replacing an old granite block which is being made smooth by a sand-asphalt surface; long-radius corners and sidewalk replacing. 2,500 words. Municipal Journal and Public Works, June 19, New York.

Stone Macadam Roads. How shall we build them now? Paper before Road School of the Wisconsin Highway Commission, by W. C. Buetow, division engr., Wisconsin Highway Commission. 1 ill., 2,600 words. Good Roads, July 2, New York.

Some Suggested Changes in Concrete Sidewalk Specifications. Elimination of cinder foundation; underdrainage; one-course concrete recommended. By C. E. De Leuw, of Gates & De Leuw, Chicago. 1,000 words. Municipal and County Engineering, July, Indianapolis, Ind.

Design:

Influence of Motor Traffic on Road Design. Preliminary studies for designing of main interurban motor transport roads; transportation surveys, laws and regulations, widths, grades, curves, bridges, drainage and foundations, wearing surfaces, detours and other considerations. By A. H. Blanchard, consulting highway engr. 3,500 words. Good Roads, July 23, New York.

Standard Sections of Highways of New Jersey State Highway Department. Brick, concrete and bituminous concrete, various conditions. 10 illus., 1 page. Engineering and Contracting, July 2, Chicago, Ill.

Character and Cost of Highways for Motor Truck Use. Will have concrete foundations, will be not less than 20 feet wide and will cost from \$35,000 to \$40,000 per mile. By S. Whitney, civil engineer, New York City. Table. 1,700 words. Engineering News-Record, July 10, New York.

Cleveland Underdrains All New Pavements. Methods and advantages of artificially draining the subsoil. By F. R. Williams, paving engr. 2 illus., 1,300 words. American City, July, New York.

Notes on Road Foundations, Drainage and Culverts. Moisture content of subgrade; movement of capillary water; location and size of culverts. By U. W. Christie, Sufferin county engr., Ontario. 2,200 words. Municipal and County Engineering, July, Indianapolis, Ind.

Surveying for Highway Improvement. Future usefulness of roads dependent upon painstaking preliminary work; importance of location; cross-sections. By F. G. Phillips, division engr., Kentucky Dept. of Public Roads. Paper before "Road Builders' Week" of University of Kentucky. 1 ill., 1,100 words. Good Roads, July 9, New York.

Construction:

Central Mixing Plant Versus Paving Mixer. Editorial discussion of the advantages and disadvantages of central mixing station. 400 words. Municipal Journal and Public Works, July 12, New York.

How to Get Clean-Cut Grading Jobs. Proper methods in light and heavy work; tractor and grader operation; right machinery and capable men are indispensable. By F. F. Mengel, div. engr., Wisconsin Highway Dept. 2,500 words. Good Roads, July 25, New York.

Road-Construction Problems in West Virginia Mountains. Narrow, curved roads without material storage space. Specially arranged tracks used for hauling. By M. A. Rogers, engineer in charge for McDowell Co., W. Va. 3 illus., 180 words. Engineering News-Record, July 10, New York.

Convict Labor on Highways Good Business. Experiences of highway officials in many states demonstrate efficiency of prison labor on roads and physical, mental and moral benefits accruing to convicts. 4 illus., 2,800 words. Good Roads, July 30, New York.

Convict Labor as Utilized on Arizona Highways. Special handling. Free men for machine operators and foremen. 900 words. Engineering News-Record, July 10, New York.

Unit Price Contracts Vs. Percentage Contracts. Progress dependent upon incentive; unit prices decreasing. Address at meeting of Northwest Ass'n of General Contractors, St. Paul, Minn., by W. L. Darling, 1,500 words. Canadian Engineer, July 10, Toronto, Can.

Guaranties from Contractors. Opinions of courts in various states as to bonds or retained percentages to insure maintenance of pavements; most courts hold them to be guaranties of quality of work only. By J. Simpson. 3,000 words. Municipal Journal and Public Work, July 12, New York.

Maintenance:

Macadam and Gravel Road Maintenance. Intelligent and continuous care necessary to conserve the investment represented by highways already improved. Paper before "Road Builders' Week" of University of Kentucky, by R. C. Heath, road engr., Ky. Dept. of Public Roads. 2,000 words. Good Roads, July 9, New York.

Methods of Maintaining Winter Roads in Quebec. Abstract, paper before Canadian Good Roads Congress. By A. Lalonde, assistant engineer, Outremont, Que. 1,300 words. Engineering and Contracting, July 2, Chicago, Ill.

Miscellaneous:

A Page of Useful Tables for the Highway Engineer. Quantity of stone in road; area of waterways; earthwork; weights and areas of steel bars. Used by Connecticut State Highway Dept. Engineering and Contracting, July 2, Chicago, Ill.

Practical Hints for the Road Foreman. Abstract from paper before Canadian Good Roads Congress, by Alexander Fraser, assistant chief engineer, dept. of highways, Province of Quebec. 800 words. Engineering Contracting, July 2, Chicago, Ill.

Instruction for Field Inspection of Road Materials Guide for sampling and inspecting materials issued by New Jersey state highway dept. 4,000 words. Engineering and Contracting, July 2, Chicago, Ill.

Commercial Sizes of Crushed Stone. Results of survey of crushing plant practice conducted in 1918 in five states. Abstract of article by F. H. Jackson and C. W. Mitman, in "Public Roads," 2 tables, 2,000 words. Engineering and Contracting, July 16, Chicago, Ill.

Proposed Tests and Specifications for Road Building Materials. Recommended in the report of the Committee D-4 on road materials of the American Society for Testing Materials. 2 ills., 2,000 words. July 2. 1 ill., 2,000 words. July 9. Good Roads, New York.

Highways and the Duty of Their Builders. Modern motor truck transportation demands durable all-year roads that will make profits. By S. M. Williams, pres., Highways Industries Ass'n. 5 ills., 1,000 words. Good Roads, July 23, New York.

Hens as Road Builders. Hens to pay off road bonds by means of the eggs they lay. Novel idea reported from Howell county, Mo. 200 words. Municipal Journal and Public Works, July 12, New York.

Construction Work in New York Last Year. Extracts from the report of First Deputy Commissioner Breed on the work of the construction department of the State Commission of Highways during 1918. 1 ill., 2,500 words. Good Roads, July 9, New York.

Brief Survey of the Road Organization in France. Beneficial effects of surface tarring. Paper before the Institution of Municipal and County Engineers at Edinburgh, by Lt.-Col. A. Forbes. 6 ills., 6,000 words. Journal of the Institution of Municipal and County Engineers, June, London, England.

Comparison of Road Subgrade and Air Temperatures. University of Illinois erects thermograph to study variations; changes in air temperature slow to affect subsoil. By C. C. Wiley, asso. in civ. engrg., University of Illinois. 2 ills., 1,000 words. Engineering News-Record, July 17, New York.

SEWERAGE AND SANITATION

Sewage Treatment:

The Cantonment Sewage Tanks. Difficulties experienced in operating them, reasons therefor in the opinion of several experts, and means devised for eliminating them; sewage of unusual concentration and high grease content. 2 ills., 3,700 words. Municipal Journal and Public Works, July 26, New York.

The Doten Sewage Tanks. Editorial discussion of the difficulties experienced in operating them and the causes; lesson learned. 500 words. Municipal Journal and Public Works, July 26, New York.

Sludge Utilization. Editorial discussion of the successful work done in Birmingham, England, in the treatment of sewage sludge, with reference to a paper by J. D. Watson, entitled "The Utilization of Sewage Sludge," before the Institution of Municipal and County Engineers. 800 words. Municipal Engineering and Sanitary Record, July 10, London, England.

Association of Managers of Sewage Disposal Works. Papers on the West Riding Rivers Board and grease recovery at Huddersfield, England. 1,700 words. Municipal Engineering and Sanitary Record, July 10, London, England.

Test of Air Diffusers for Activated Sludge Process. Abstract of a thesis the basis of which was formed from tests conducted at the University of Illinois. Prepared by F. L. Mickle under supervision of Edward Bartow. 1,600 words. Engineering and Contracting, July 9, Chicago, Ill.

Efficient Control of Small Sewage Works. Measurement of sewage flow and sludge; some simple tests. 1,500 words. Municipal and County Engineering, July, Indianapolis, Ind.

Lake-Water Diversion and Sewage Treatment at Chicago. Sanitary district plans compensating works to hold lake levels; sewage treatment to supplement dilution. 600 words. Engineering News-Record, July 31, New York.

Indianapolis Sewage Purification Plant. Description of up-to-date system to be installed; inverted siphon used to convey sewage under river. E. C. Hurd, Indianapolis. 1 ill., 1,000 words. Fire and Water Engineering, July 30, New York.

Extraction of Grease from Sewage Sludge at Morley. Expenses and receipts of extracting plant. By F. Turner, boro. engr., from the "Surveyor," May 30. 1 ill., 3,200 words. Engineering and Contracting, July 30, Chicago, Ill.

Sewage Treatment Works of Birmingham, England, and Utilization of Sludge. By J. D. Watson, engr., Birmingham Tame and Rea District Drainage Board. From the "Surveyor," July 4. Engineering and Contracting, July 30, Chicago, Ill.

Sewerage:

Some Broader Aspects of Rain Intensities in Relation to Storm Sewer Design. Simpson's theory of the thunderstorm; inconstancy of rainfall rates. By R. E. Horton, hydraulic engr., Albany, N. Y. (Concluded.) 11 charts, 6,000 words. Municipal and County Engineering, July, Indianapolis, Ind.

Sewer-Construction Records Used at Scarsdale, N. Y. Daily record blank, rock book and sample headings from final estimate book used on 22 miles of sewers. By P. Thompson, Yonkers, N. Y. 4 ills., 1,500 words. Engineering News-Record, July 17, New York.

Sewage and Dissolved Oxygen in New York Harbor. No putrefaction in main channels likely during cold months of year; increasing reduction of oxygen in warm months points to growing need for some degree of treatment. 2 ills., 2 tables, 1,400 words. By K. Allen, sanitary engr., Board of Estimate and Apportionment, N. Y. C. Engineering News-Record, July 31, New York.

Sanitation and Municipal Death Rates. Personal precautions, board of health work and sanitation compared; development of municipal sanitation; cost and results. By Geo. A. Soper, Ph. D., paper before Second Pan-American Commercial Conference. 2,500 words. Municipal Journal and Public Works, July 5, New York.

Power of Municipalities to Suppress and Prevent Spread of Contagious and Infectious Diseases. By W. P. Butcher, city attorney of Santa Barbara, Cal. 3,500 words. Pacific Municipalities, July, San Francisco, Cal.

Malaria Caused by Non-drainage of Irrigation Lands. Wet areas due to seepage from irrigation canals result in loss of health and lowering of property values. 800 words. Engineering News-Record, July 31, New York.

Visualizing the Recent Pandemic in Army Camps. Use of spot maps, growing columns and case-and-rate curves for studying progress of influenza and pneumonia in cantonments and other stations. By George A. Soper, major, Sanitary Corps, United States Army. 6 ills., 2,400 words. Engineering News-Record, July 10, New York.

The Private Well and Privy Vault. Can the public afford to tolerate these menaces? The financial side of question; necessity of screening and sterilization where no sewers exist. By R. E. Tracy, director, Bureau of Governmental Research, Indianapolis Chamber of Commerce. 2,000 words. Fire and Water Engineering, July 30, New York.

Conclusions of International Joint Commission on Pollution of Boundary Waters. Pollution can be prevented or remedied without imposing unreasonable burden upon offending communities. 800 words. Engineering and Contracting, July 9, Chicago, Ill.

WATER SUPPLY.

Reservoirs:

Spillway Capacities Required for Reservoirs in Western United States. Based on a study of the flood discharges of 402 North American and 60 European and Indian records, with curves of probable flood discharges for far western streams. By J. T. Whistler, engr.-adviser, Federal Farm Loan Bureau. Charts and tables, 4,500 words. Engineering News-Record, July 3, New York.

Lining a Reservoir with Concrete by the Cement Gun. Costs and progress made, given for operations in irrigation district during current high-price period. By E. Court Eaton, supt. and engr., Lindsay-Strathmore Irrigation Dist., Lindsay, Cal. 2 ills., 1,000 words. Engineering News-Record, July 24, New York.

Need and Cost of Covering the Clear Water Basins of the St. Louis, Mo., Water Works. Organisms present in uncovered reservoirs; types of covers considered. By C. M. Dally, engr., water division, Dept. of Public Utilities, St. Louis. 1 ill., 1,300 words. Municipal and County Engineering, July, Indianapolis, Ind.

Increase of Maine Water Powers Through Regulation. By construction of storage reservoirs the 24-hour service for 60% of year will be increased 12%. 1 table, 400 words. Electrical World, July 12, New York.

Pipe Lines:

Another Pipe Bend Failure. 48-inch main broken open at a 45-degree bend at a stream crossing at Wilmington, Del.; described by E. M. Hoopes, Jr., chief engr. of the Wilmington Water Dept. 2 ills., 500 words. Municipal Journal and Public Works, July 26, New York.

Flanges for Light Cast Iron Pipe. Investigation of question; proposed standard suggested by American Society of Mechanical Engineers' committee; American Gas Institute flange; proposal that American Water Works Association take matter up with other societies. By J. Knickerbacker, pres., Eddy Valve Co., Troy, N. Y. 1 ill., 800 words. Fire and Water Engineering, July 16, New York.

Diagrams for Excess Loss of Head in Pipe Lines. Losses due to 90-degree bends, increasers, gate valves, reducers and branches readily found; examples given. By F. S. Bailey, asst. engr., Metcalf & Eddy, Boston. 3 charts, 1,200 words. Engineering News-Record, July 24, New York.

Concrete Pipe Fails from Unequal Expansion of Shell. Longitudinal cracks in unreinforced pipe conduit seem due to differential movement because of partial wetness. By G. E. P. Smith, prof. of irrigation, University of Arizona. 3 ills., 2,000 words. Engineering News-Record, July 17, New York.

Experiences with Metalum Joints in Water Pipe Lines in Davenport, Ia. By T. Healy, Davenport Water Co. 900 words. Municipal and County Engineering, July, Indianapolis, Ind.

Successful Use of Cement Joints for Cast Iron Water and Gas Mains. By S. E. Kleffer, consulting engr., San Francisco. 1,000 words. Municipal and County Engineering, July, Indianapolis, Ind.

Use of Cement Joints for Cast Iron Water and Gas Mains. Successfully used in construction of the U. S. Housing Corporation Project at Vallejo, Cal.; methods of construction used and results obtained. 800 words. Engineering and Contracting, July 9, Chicago, Ill.

Hexagonal Chart for Finding Velocity of Water in Pipes. Single diagram embraces six variable quantities without using a single curve; use of transparent index suggested. By C. W. Anthony, Bahia Blanca, Argentine Republic. 1 ill., 500 words. Engineering News-Record, July 24, New York.

Pumping:

Pumping Machinery. Used by the Service of Supply of the American Expeditionary Force in France. 1,500 words. Engineering World, July 1, Chicago, Ill.

Air-Lift Pumping. Demonstrated time and again that air-lift, even with its lower theoretical overall power efficiency, but with immunity from derangement, has been placed ahead of deep-well pumps under many conditions of operation. By John Oliphant, mgr., Air-Lift Pumping Dept., Sullivan Machinery Co., Chicago. 7 ills., 2,500 words. Canadian Engineer, July 10, Toronto, Can.

The "Uniflow" Pumping Engine. Distinct step in advance of other types of reciprocating engines; sketch showing a typical Uniflow steam cylinder and indicator card. Abstract of paper before the American Water Works Ass'n, by D. E. DeCrow, chief engr., Worthington Pump & Machinery Co., Harrison, N. J. 2 ills., 800 words. Engineering and Contracting, July 9, Chicago, Ill.

Purification:

Typhoid and Water Disinfection in Maryland. Effect of use of chlorine in 18 supplies, as indicated by typhoid deaths before and after. 2 tables, 500 words. Municipal Journal and Public Works, July 19, New York.

Niagara Falls and Water Chlorination. Method of manufacturing hypochlorite and liquid chlorine; development of apparatus for applying the latter; extent of use. 2,500 words. Municipal Journal and Public Works, July 5, New York.

Chlorination Results in Treatment of Water Supply of London. Super-chlorination and de-chlorination; resistance of various waters to filtration. From "The Engineer," July 4. 2,800 words. Engineering and Contracting, July 30, Chicago, Ill.

Chlorination in West Virginia. Public water supplies of that state which are so treated; results of disinfection in lowering typhoid rates. 2,300 words. *Municipal Journal and Public Works*, July 12, New York.

Design and Operation of Water Filtration. Plant at Camp Meade, Md. By C. R. Pottelger, Capt., Q.M.C., Camp Meade. 7,000 words. *Municipal and County Engineering*, July, Indianapolis.

Army Water Purification Units. Motor-driven water trucks for chlorinating and filtering supply for the A. E. F.; experimentation did not affect basic principles of design; description of the unit. By Wm. J. Orchard, sanitary engr., Wallace & Tiernan Co., Inc., N. Y. C. 4 ills., 2,500 words. *Fire and Water Engineering*, July 23, New York.

Water Testing Stations. Water purification methods accomplished principally with their aid; design and method of construction; the Whiting testing station; results of tests; table of costs. By W. T. McClenahan and R. S. Rankin, engr., Chicago. 1 ill., 3,000 words. *Fire and Water Engineering*, July 9, New York.

Point St. Charles Filtration Works, Montreal. Results of first year's operation; efficiencies during last nine months from 96.2% to 99.1% without chlorination, and from 98.1% to 99.8% with chlorination. 8 ills., 3,000 words. *Canadian Engineer*, July 24, Toronto, Can.

Waste and Metering:

Water Waste Control by House Inspections with District Metering. Development of Deacon system; new portable flow meter; periodical remeasurements. From paper before Southwestern Water Works Ass'n, by E. D. Case, vice-pres., Pitometer Co., N. Y. C. 2,500 words. *Canadian Engineer*, July 24, Toronto, Can.

Water Meters in Milwaukee. 65,072 in service, of which 55,586 were $\frac{1}{2}$ -inch; in 1918, 14,824 meters were repaired; total cost of operation was \$52,675.41. 250 words. *Municipal Journal and Public Works*, July 5, New York.

Reduction of water consumption in Buffalo. From more than 300 gallons per capita to nearly 200; pitometer survey and house inspection. By G. C. Andrews, water commissioner of Buffalo. Paper before American Water Works Ass'n. 4,000 words. *Municipal Journal and Public Works*, July 26, New York.

Flat Rate Vs. Meters. Comparison between operating conditions under the two methods of charging for water consumed; flat rate system unjust to consumer; meterage provides best method of checking operations; saving effected by meters. By C. E. Abbott, supt. of water works, Tuscaloosa, Ala. 1,500 words. *Fire and Water Engineering*, July 2, New York.

Metering and Water Consumption. Problem of water waste, and the elements affecting its elimination; maintenance of meters; importance of complaint bureau; methods of making waste surveys; high bills caused by leakage; centralized management. By H. P. T. Matte, chief sanitary engr., Illinois State Department of Health. 5 ills., 3,200 words. *Fire and Water Engineering*, July 2, New York.

Reduction of Water Waste by Means of Pitometer Survey and Constant Inspection. Abstract of paper before American Water Works Ass'n, by G. C. Andrews, water commissioner of Buffalo, N. Y. 1,700 words. *Engineering and Contracting*, July 9, Chicago, Ill.

Operation:

Economy Kinks in Water Works Operation in Omaha. H. V. Knouse, superintendent, describes how coal is purchased, alum-cake plant operated and trucks utilized. 500 words. *Engineering News-Record*, July 3, New York.

Water Works Accounting and Billing. System and methods recently adopted at Milwaukee; accounts on block system; billing machines; no receipts returned. 1,400 words. *Municipal Journal and Public Works*, July 12, New York.

Free Water. Editorial comment on the practice of cities of giving free water to charitable and religious organizations; better plan to charge all these and have council appropriate funds for paying bills. 200 words. *Municipal Journal and Public Works*, July 26, New York.

Conclusions of American Water Works Association. Committee of private fire protection service. 1,700 words. *Engineering and Contracting*, July 9, Chicago, Ill.

Water Rates and Fire Protection Charges. Data from several hundred cities of the United States; maximum and

minimum rates; changes since before the war; receipts for public hydrants and private fire protection. 2 pages table, 400 words. *Municipal Journal and Public Works*, July 19. 2 pages table, 400 words, July 26, New York.

Miscellaneous:

Cost of Labor and Material for Construction. Operation and Maintenance of Water Works. Interesting data given by L. Metcalf, of Boston, Mass., in a paper before the American Water Works Ass'n. 2 tables, 1,200 words. *Engineering and Contracting*, July 9, Chicago, Ill.

Relation of Depreciation to Investment. Has received until recently little consideration from water companies; uniform system of accounting; reproduction cost less depreciation; treatment of amount collected for depreciation; right to return on replacement fund. Paper before Pennsylvania Water Works Ass'n, by W. C. Hawley, chief engr. and general supt., Pa. Water Co. 6,500 words. *Canadian Engineer*, July 10, Toronto, Canada.

Present Tendencies and Influence of War Period on Public Utility Commission Decisions. Public ownership losing popularity; financial burdens due to war borne by waterworks. Abstract of paper before American Water Works Association, by L. Metcalf, of Metcalf & Eddy, Boston, Mass. 2,500 words. *Engineering and Contracting*, July 9, Toronto, Canada.

Some Experiences Gained in Private Ownership of Public Water Supply Works at Council Grove, Kan. By L. L. Tribus, of Tribus & Massa, N. Y. C. 1 ill., 2,500 words. *Municipal and County Engineering*, July, Indianapolis, Ind.

Design and Construction of the Water Supply System of Camp McClellan, Ala. By M. R. Scharff, asst. chief engr. with Morris Knowles, Inc., Pittsburgh. 2,500 words. *Municipal and County Engineering*, July, Indianapolis, Ind.

The Gravity Water Supplies of Le Roy and Newark, N. Y. Chlorination of supplies; a comparison of costs. By J. P. Wells, consulting engr., Rochester, N. Y. 1 page tables, 2 ills., 2,000 words. *American City*, July, New York.

Milwaukee Water Works. Average daily consumption during 1918, 62½ million gallons; new intake tunnel. 1,000 words. *Municipal Journal and Public Works*, July 19, New York.

Water Works Situation at Toronto. Consumption is increasing and additional filtration and pumping capacity may soon be required; works commissioner favors new construction. 1,000 words. *Canadian Engineer*, July 3, Toronto, Can.

The Gallery Collecting System of the Des Moines, Ia., Water Co. Abstract of an interesting description of this system in a paper before the Iowa Section of the American Water Works Association, by A. T. Luce, engr. and supt. of the Des Moines Water Co. 2 ills., 2,700 words. *Engineering and Contracting*, July 9, Chicago, Ill.

Artesian Well Supply at Baton Rouge, La. With chart giving relation between yield of wells and lowering of static water levels. By L. R. Howson, asst. engr., Alvord & Burdick, Chicago. 2 ills., 1,400 words. *Engineering and Contracting*, July 9, Chicago, Ill.

Water Expectancy in Tunnels, Mines and Deep Wells in Homogeneous Rocks. From Journal of American Water Works Ass'n, by R. E. Horton. 1,500 words. *Canadian Engineer*, July 3, Toronto, Can.

Safeguarding the Water Supply of New York City. Data on available supply; 19 well systems in reserve; 168 square miles in Ridgewood system; Esopus watershed covers 257 square miles. By F. E. Hale, chief chemist, Dept. of Water Supply, Gas and Electricity, N. Y. C. 1 ill., 2,200 words. *Engineering World*, July 15, Chicago, Ill.

Studies in the Bacteriology of Water. The B. Coli group; the streptococcus group. By Denis B. Wood, from paper before the Institution of Water Engineers. 2,700 words. *Engineering and Contracting*, July 30, Chicago, Ill.

LIGHTING AND POWER.

Lighting:

The New Street Lighting System in city of Niagara Falls, N. Y. By E. J. Fort, city manager, Niagara Falls. 2 ills., 1,000 words. *Pacific Municipalities*, July, San Francisco, Cal.

The New Street Lighting System in city of Niagara Falls, N. Y. Expense of maintenance to the city is very small. 2 ills., 900 words. *American City*, July, New York.

Records of Customers Kept in Columbus, O. Simple, thorough system; forms used to facilitate business. 1 ill., 500 words. *Electrical World*, July 12, New York.

Service Tests of Small-Capacity Meters. Schedules of tests; experiences as to errors; paper before Ohio Electric Light Ass'n. By A. H. Bryant, meter engr., Cleveland Electric Illuminating Co. 3,800 words. *Electrical Review*, July 26, Chicago, Ill.

Power Plants:

New Kern River Development. Southern California Edison Co. plant has two Francis turbines, operating under head of 800 feet. By G. E. Armstrong, Southern California Edison Co. 3 ills., 2,500 words. *Electrical World*, July 19, New York.

Practical Operation of Steam Boilers. Useful suggestions for securing efficiency in boiler-room operation given by W. E. Snyder, of the American Steel & Wire Co., in a paper before the Engineering Society of Western Pennsylvania. 3,800 words. *Engineering and Contracting*, July 9, Chicago, Ill.

Northwest Pennsylvania's Newest Station. Power house has latest ideas of tested engineering practice; built on unit principle; eventual rating, 120,000 k.w. By J. B. Scott, engr. staff, Day & Zimmerman, Inc. 6 ills., 2,000 words. *Electrical World*, July 12, New York.

Comparison of Mechanical Stokers. Classification of mechanical stokers; salient features of different stokers; influence of stoker upon draft, combustion chamber, etc. By Robert June, mechanical engr. 4 ills., 2,200 words. *Electrical Review*, July 19, Chicago, Ill.

The Still Engine: A New Prime Mover. Utilization of fuel and cooling medium features of the engine; high terminal efficiency and low unit of weight are other valuable properties; special applications. 2 ills., 2,000 words. *Electrical Review*, July 19, Chicago, Ill.

Transmission Line Relay Protection. Review of typical applications of current and directional relays; excerpts from American Institute paper. By D. W. Roper, H. R. Woodrow, O. C. Traver and P. MacGahan. 8 ills., 5,300 words. *Electrical Review*, July 5, Chicago, Ill.

Selection of Economical Transmission Route. Development of equation and curves which simplify choice between several available routes; balancing extra cost of right-of-way for short route against expense for greater length of ordinary line construction. By P. O. Reyneau, distribution engr., Detroit Edison Co. 1 chart, 2,400 words. *Electrical World*, July 26, New York.

Assuring Continuity of High-Tension Transmission. Need of good insulators; careful patrolling and prompt repairing necessary guard against fires. By John M. Drabell, mechanical and electrical engr., Ia. Railway & Light Co., Cedar Rapids, Ia. 1,300 words. *Electrical World*, July 12, New York.

Super-Power Line Is Proposed in Northeast. To connect generating stations at large centers with power and steam at mines; national matter rather than local. 1,000 words. *Electrical World*, July 12, New York.

Miscellaneous:

Central-Station Rates in Theory and Practice. Outline of articles covering whole subject; systems of charging; rate analysis; accuracy of rates; public utilities and public regulation. By H. E. Eisenmenger. 1,400 words. *Electrical Review*, July 5, Chicago, Ill.

Central-Station Rates in Theory and Practice. First article of series; various kinds of costs; general principles by which service costs can be determined; application to cost of electric service. 5,500 words, July 12. Second article of series; cost analysis of electric service; energy cost and demand cost; some features determining demand cost; load curve and load-factor. 4 ills., 3,500 words, July 19. Third article; capital charges of central stations and how they affect demand cost; interest and depreciation; influence of peak load on expense. 3 ills., 5,300 words, July 26. By H. E. Eisenmenger, *Electrical Review*, Chicago, Ill.

Electric Light and Power Stations of New York State. An interpretation of items of income, operating expenses, primary power and output as contained in the census report. By S. G. Koon, M.M.E. 1,200 words. *Electrical World*, July 19, New York.

Some Features of Hydro-Electric Engineering Practice and Possibilities. One development serves 84 cities and towns; advantages and disadvantages of water power. By H. de B. Parsons, consulting engr., N. Y. C. 4,300 words. *Municipal and County Engineering*, July, Indianapolis, Ind.

Expansion of A. I. E. E. Activities Proposed. Convention of American Institute of Electrical Engineers discussed subjects of transmission, distribution and insulation. 5,500 words. *Electrical World*, July 5, New York.

A. I. E. E. Convention at Lake Placid. President Adams' address on problems of the day makes co-operation the keynote; technical matters receive their due; features of convention. 1 ill., 7,000 words. *Electrical Review*, July 5, Chicago, Ill.

STREET CLEANING AND REFUSE DISPOSAL.

Refuse Collection:

Refuse Collection in Rochester. Horse-drawn vs. motor vehicles; work methods employed and suggested changes; frequency of collection; amounts of refuse. 1 ill., 2,500 words. *Municipal Journal and Public Works*, July 5, New York.

Organization for Refuse Collection. Study of operation and efficiency of existing plan at Rochester and recommended organization of "Bureau of Sanitation." 3 ill., 3,000 words. *Municipal Journal and Public Works*, July 12, New York.

Public Co-Operation in Refuse Collection. Duties and responsibilities of householders not realized by them; should separate refuse and provide suitable receptacles in accessible places. 2 ill., 2,000 words. *Municipal Journal and Public Works*, July 19, New York.

Cost of Maintaining City-Owned Teams. Data from report of Bureau of Municipal Research, Rochester, N. Y. 1,500 words. *Engineering and Contracting*, July 2, Chicago, Ill.

Cost of Motor Truck Operation for Refuse Collection. Data from investigation by Bureau of Municipal Research, Rochester, N. Y. 2,500 words. *Engineering and Contracting*, July 2, Chicago, Ill.

Lower Refuse Collection Wagons. Letter from Arthur E. Peterson, supt., Crematory Division, Spokane, Wash., referring to an editorial in the June 28th issue, and stating what had been done in Spokane after investigation of this problem. 400 words. *Municipal Journal and Public Works*, July 26, New York.

Street Sweeping:

Motor Vehicles at Blackpool, England. A gasoline-operated street sweeper is used and six electric vehicles said by the "cleansing superintendent" to have been very successful. 600 words. *Municipal Journal and Public Works*, July 26, New York.

Motorization of Sweeping Machines. Street department of Albany, N. Y., now using tractors for hauling the sweeping machines. 1 ill., 250 words. *Municipal Journal and Public Works*, July 5, New York.

Miscellaneous:

Garbage Disposal by Feeding Successfully Practiced at Lansing, Mich. Collection with motor equipment; some discouraging features. By E. C. W. Schubel, supt. garbage dept., Lansing. 4 ill., 2,200 words. *Municipal and County Engineering*, July, Indianapolis, Ind.

Institute of Cleansing Superintendents. Suggestions for improvements in apparatus and appliances for dealing with house refuse. Annual Conference at Blackpool, Eng. 2,500 words, July 3, 2,500 words. July 10. *Municipal Engineering and Sanitary Record*, London, England.

TRAFFIC AND TRANSPORTATION.

Motor Truck Transportation:

The Relative Economy of Freight Transport by Railway and by Motor Truck. The light-traffic problem and its relation to public welfare. Highway and railway construction and maintenance costs. Cost of moving traffic by railway and by highway. Road costs and hauling costs combined. Conditions which favor motor-truck operation. Making light traffic railways pay. Business organization of light-traffic railways and of motor truck lines. By Charles Whiting Baker, consulting editor "Engineering News-Record." 19,200 words. *Engineering News-Record*, July 10, New York.

Hauling Over the Highways with Motor Trucks. Various services performed by vehicles in rural motor express and inter-city hauling; examples and cost data. 14 ill., 2,000 words. *Good Roads*, July 23, New York.

Uses of the Motor Truck in Highway Work. Road and street contractors and highway departments of states, counties and cities find many and varied uses for trucks and trailers in road construction and maintenance. 8 ill., 1,500 words. *Good Roads*, July 23, New York.

Haul Gravel with Caterpillar Tractor in Minnesota. Renville county uses a 12-h. p. machine with train of nine wagons; itemized costs. 1 ill., 1 table, 500 words. *Engineering News-Record*, July 31, New York.

Trailers and Trucks for Highway Hauling. How the trailer solves special haulage problems, reduces road repair and maintenance costs and cuts down cost of highway transportation. By H. W. Wilkin Perry, gen. mgr., Trailer Manufacturers' Ass'n of America. 7 ill., 2,800 words. *Good Roads*, July 23, New York.

Motor Transportation by the Army. Work of the Motor Transport Corps; trans-continental convoy; national road system a military necessity. By J. M. Riche, lieut.-col., Motor Transport Corps. 2 ill., 1,500 words. *Good Roads*, July 23, New York.

Street Railways Finances.

Incentive to Efficiency Is Needed. Fixing of rigid rate of return limits value of service-at-cost franchises. By W. C. Culkins, director of street railroads, Cincinnati. 1,000 words. *Electric Railway Journal*, July 12, New York.

Burdens from Which We Should Be Relieved. Plea for simplification of regulation, elimination of taxes, free transportation, etc., in order to retain 5-cent fare. Abstract of paper before Central Electric Railway Ass'n, by R. B. Rifenberck, consulting engr., Detroit United Railway. 1,900 words. *Electric Railway Journal*, July 12, New York.

San Francisco's Municipal Railway Is No Gold Mine. Editorial reference to an editorial in our issue of Feb. 19 and a letter of protest by M. M. O'Shaughnessy, city engineer of San Francisco, in our issue of May 21. 800 words. *Engineering and Contracting*, July 16, Chicago, Ill.

Has the Municipal Railway of San Francisco Shown Adequate Profit? The 5% true net earnings a poor return on investment considering risks involved. By H. P. Gillette, editor. 2,000 words. *Engineering and Contracting*, July 16, Chicago, Ill.

Valuation of Electric Railway Properties. Statement filed with Federal Electric Railway Commission and read at Washington July 17. By A. M. Taylor. Philadelphia. 1,000 words. *Electric Railway Journal*, July 19, New York.

Federal Hearings Commence. Opening hearings before Federal Electric Railways Commission; case of companies; statistics on conditions. 1 ill., 5,500 words. *Electric Railway Journal*, July 19, New York.

Committee of One Hundred Ready for Hearings. Plans of American Railway Association for presenting its case before Federal Electric Railways Commission. 1,000 words. *Electric Railway Journal*, July 19, New York.

Formal Statements at Washington. Abstracts of written testimony presented by several witnesses at hearings before Federal Electric Railway Commission. Reasons for Railways' Present Condition. By L. S. Storrs, pres. The Connecticut Co., New Haven. Need for Incentive for Economical Operation under Service-at-Cost Franchises, by W. A. Draper, vice-pres., Cincinnati Traction Co. Street Railway Credit and Cost of Capital, by F. H. Sisson, vice-pres., Guaranty Trust Co., N. Y. C. Industry Needs More Than Normal Amount of Capital—Testimony by H. C. Bradlee, of firm of Stone & Webster. Data of the Industry, presented by J. W. Welsh, special engr., American Electric Railway Association. Competition of Motor Vehicles, by L. S. Storrs, pres. The Connecticut Co., New Haven. Taxation of Electric Railways, by C. J. Bullock, prof. of economics, Harvard University. 17 ill., 16,000 words. *Electric Railway Journal*, July 26, New York.

Washington Hearings Continue. Evidence on railway status of American Election Railway Association presented to Federal Electric Railway Commission by committee of 100. 9 ill., 14,000 words. *Electric Railway Journal*, July 26, New York.

Miscellaneous:

The Zone Fare in Practice. (Leeds, England.) Fare increase, 50 to 100%; traffic decrease, 3.4%; revenue increase, 23.3% last year. By Walter Jackson. 9 ill., 4,000 words. *Electric Railway Journal*, July 12, New York.

To Reduce Traffic Accidents. Highways Transport Committee is conducting a campaign of education, the aim of which is to place basic suggestions as

to safety regulations before the municipal authorities of the country. 400 words. *Municipal Journal and Public Works*, July 12, New York.

Methods of Observing and Analyzing Passenger Traffic. Merits of several methods; helpful advice on use of traffic study data. Abstract of paper before Pa. Street Railway Ass'n, by R. H. Horton, traffic engr., Phila. Rapid Transit Co. 4,500 words. *Electric Railway Journal*, July 12, New York.

Report on Cleveland Rapid Transit Recommends Street-Car Loop Subways. Consulting engineers find surface relief is first need; street-car loop system at public square should be retained, but capacity increased by placing underground; later rapid-transit system. 4 maps, 2,300 words. *Engineering News-Record*, July 24, New York.

The Highways Transport Committee in Peace. A description of the organization and work of the committee, with an outline of its plans for the future. By J. S. Cravens, chairman, Highways Transport Committee, Council of National Defense. 2,500 words. *Good Roads*, July 23, New York.

FIRE DEPARTMENT.

The International Association of Fire Engineers' Proceedings. Lively discussion of important and timely subjects; the two-platoon system and the gas mask; fire prevention. 10 ill., 38,000 words. *Fire and Water Engineering*, July 16. Official record of the doings at the annual convention; some reminiscences; fire alarm systems; value of building inspection; the Sears-Roebuck plant fire system. 2 ill., 7,000 words. *Fire and Water Engineering*, July 23.

The hazard of explosives, ammunition and fireworks considered; ammonia gas dangers and handling of acids. 10 ill., 3,500 words. *Fire and Water Engineering*, July 30, New York.

Traffic Regulations with Regard to Motor Fire Apparatus. Proper speed for motor fire apparatus and control of general traffic along fire routes. 2 ill., 1,700 words. *American City*, July, New York.

Pumping Engine Tests. At Electric Park, Kansas City, Mo., during convention of International Association of Fire Engineers; rules of contest; participants. 7 ill., 2,500 words. *Fire and Water Engineering*, July 9, New York.

Helpful Hints for Fire Apparatus and Truck Operators in Hot Weather. By A. F. Masury, chief engr., International Motor Co. 600 words. *Fire and Water Engineering*, July 9, New York.

STRUCTURES AND MATERIALS.

Concrete:

Proportioning of Pit-Run Gravel for Concrete. Ratio of cement to aggregate constant; physical characteristics of aggregates used; the "sand" method. Paper before the American Society for Testing Materials, by Prof. R. W. Crum, Iowa State College, Ames, Ia. 8 charts, 4 tables, 3,000 words. *Canadian Engineer*, July 24, Toronto, Can. 1 table, 5 ill., 2,500 words. *Engineering and Contracting*, July 2, Chicago, Ill. 8 charts, 4 tables, 3,500 words. *Concrete*, July, Detroit, Mich.

Results of Impact Tests for Determining Wear of Concrete Aggregates. Laboratory tests by New York State Highway Dept. Abstract from paper before Canadian Good Roads Congress by H. Eltinge Breed, consulting engineer. 700 words. *Engineering and Contracting*, July 2, Chicago, Ill.

Pressing Out Mix Water Adds to Cement Mortar Strength. Tests made with special apparatus permitting pressures up to 30,000 pounds per square inch give high compressive values. By C. T. Wiskocil, ass't prof. civ engrg., University of California. 3 ill., 1,700 words. *Engineering News-Record*, July 17, New York.

Curing Concrete. Results of tests to determine effect of curing conditions on strength of concrete and wear from abrasion; results much better when concrete is kept damp for several days. 2 ill., 1,400 words. *Municipal Journal and Public Works*, July 19, New York.

Bulking Effect of Moisture in Sand. With chart giving relation of moisture to volumes of sand; still plenty of room for improvements in methods of mechanical aggregates. From *Concrete in Canadian Engineer*, by Capt. L. N. Edwards. 1 chart, 600 words. *Engineering and Contracting*, July 23, Chicago.

Bonding New Cement Mortar and Concrete to Old Concrete. Summary of conclusions drawn from tests carried in the Engineering Research Laboratory of the Bureau of Public Roads by W. E. Rosen-garten, U. S. highway engineer, in recent publication of Bureau of Public Roads, 1,300 words. Engineering and Contracting, July 23, Chicago, Ill.

Cements Producing Quick-Hardening Concrete. Concrete made with Sorel cement and with calcium-aluminate cements. Paper before American Society for Testing Materials, by P. H. Bates, 4,500 words. Canadian Engineer, July 3, Toronto, Can. 3 tables, 3,500 words. Engineering and Contracting, July 23, Chicago, Ill.

Gravel Aggregate Does Not Make Fire-Resistive Concrete. Report of Committee of Concrete Institute from tests and experience. 1,500 words. Engineering News-Record, July 10, New York.

Preparation of Specifications for Concrete. Practical and advantageous to specify according to strength or any other quality desired; some specifications result in unknown factors of safety. By I. F. Morrison, asst. professor of structural engrg., University of Alberta. 800 words. Canadian Engineer, July 24, Toronto, Can.

Other Materials:

Concentrated Load Tests of Yellow Pine Beams for Shear. Recommends 50 per cent increase in previous horizontal shear values used in design. By L. R. Manville and C. R. Hill. 4 ills., 2,300 words. Engineering News-Record, July 10, New York.

Properties of Malleable Cast Iron. Paper before American Society for Testing Materials gives strength data obtained from tests of commercial specimens of material. 6 charts, 1,000 words. Engineering News-Record, July 17, New York.

Bridges:

The Placement of the Delaware River Bridge. Description of projected interstate bridge connecting New Jersey and Delaware; preliminary studies; elements of design and reasons for location; traffic census; architectural treatment. By W. P. Laird, prof. of architecture, University of Pennsylvania. 11 ills., 8,000 words. Journal of the Engineers' Club of Philadelphia, June, Philadelphia.

Substructure of Michigan Avenue Bascule Bridge, Chicago. Cylinder piers sunk to rock and hardpan carry large concrete tailpits for double-deck bridge; steel columns embedded in walls support girders for trunnions and uplift anchorage. By H. E. Young and W. A. Mulcahey, engr. of bridge design and engr. of construction, respectively. 4 ills., 2,000 words. Engineering News-Record, July 31, New York.

Test of Sandy Foundations at Arch Bridge Pier. Settlement measured by gauge at top of timber mass passing through completed concrete base. By A. Richards, deputy co. engr., Columbus, O. 2 ills., 1,200 words. Engineering News-Record, July 31, New York.

Highway Bridges and Heavy Trucks. Report to the American Road Builders' Ass'n by its committee on methods of strengthening and reconstructing highway bridges for heavy motor truck traffic. From Municipal Journal. 2,300 words. Pacific Municipalities, July, San Francisco, Cal.

Problems Encountered in the Design of 12th Street Bridge. Single-leaf span over present channel; double-leaf bridge over new channel; summary of advantages and disadvantages; old and new schemes. By H. E. Young, engr. of bridge design, Chicago. 16 ills., 7,000 words. Engineering World, July 1, Chicago, Ill.

Lightning Pushes Sidewalk Off Concrete Bridge. Accident in Iowa City, Ia. 4 ills., 600 words. Engineering News-Record, July 10, New York.

Strengthening Old Iron Bridges by Reinforced Concrete Arch Ribs. By Maj. A. T. Davis, from "The Surveyor," July 4. 3 ills., 1,400 words. Engineering and Contracting, July 30, Chicago, Ill.

Points Requiring Special Observation and Investigation in Bridge Inspection. Paper before Brooklyn Engineers' Club, by H. C. Keith. 4,000 words. Canadian Engineer, July 17, Toronto, Can.

Other Structures:

Pittsburgh South Hills Tunnel and Earlier Projects. Chief features of location and relation to prior projects; approach from city by way of new bridge. 1 map, 1,200 words. Engineering News-Record, July 24, New York.

Proposed Type of Concrete Block for New York Tunnel. 2 ills., 900 words. Concrete, July, Detroit, Mich.

Backfilling Tunnel Through Holes Bored from Surface. Concrete poured around 60-inch cast iron pipe in 10x10-foot rock bore by dropping it 70 feet from trestle across river. By J. Armstrong, division engr., Greater Winnipeg Water Dist., Winnipeg, Man. 2 ills., 1,500 words. Engineering News-Record, July 24, New York.

The Stability of Reinforced Concrete Retaining Walls. With diagram by which solution of final equations is obtained graphically; enables designer to find easily the most economical dimensions of base of the wall. By F. Zimmerman, 66 Hartford street, Dorchester, Mass. 4 diagrams, 2,300 words. Engineering and Contracting, July 23, Chicago, Ill.

Making Concrete Blocks for Toronto Breakwater. New plant located on Toronto Harbor Commissioners' reclaimed dockage at foot of Spadina avenue; pouring concrete blocks weighing 10 and 18 tons, respectively; special design of collapsible wooden forms; economical handling in limited space. By F. Phillips, asst. engr., Roger Miller & Sons, Ltd., Toronto. 3 ills., 800 words. Canadian Engineer, July 10, Toronto, Can.

Friction Tests and Capacity Table for Cement Pipe. Interesting data given in a bulletin prepared by G. E. P. Smith, irrigation engr. of the University of Arizona. 3 tables, 1,400 words. Engineering and Contracting, July 9, Chicago, Ill.

Concrete Railway Track Support. Various types installed on American railways described by A. C. Irwin, engineer of Structural Bureau of the Portland Cement Ass'n, in paper before the American Concrete Institute. 9 ills., 2,000 words. Engineering and Contracting, July 16, Chicago, Ill.

Meeting of American Society for Testing Materials. Society decides on independent headquarters and expands its co-operative work; development in steel and concrete; Marburg memorial meeting. 7,000 words. Engineering News-Record, July 3, New York.

MISCELLANEOUS.

The Future of the American Association of Engineers. Abstract of presidential address by F. H. Newell at annual convention. 5,000 words. Municipal and County Engineering, July, Indianapolis, Ind.

Institution of Municipal and County Engineers. Annual conference at Birmingham. Arterial roads and town planning, housing policy, refuse and disposal department at Birmingham, England. 2,300 words. Municipal Engineering and Sanitary Record, July 3, London, England.

Engineers and Unions. Editorial discussion of the advantages of a "Union of Engineers" affiliated with the American Federation of Labor, but with its own constitution and own methods of working, which is a future possibility. 700 words. Municipal Journal and Public Works, July 5, New York.

Membership and Functions of Local Engineering Associations. Suggestions for development committee by C. W. Hunt, secretary, American Society of Civil Engineers. 1,400 words. Engineering News-Record, July 10, New York.

New York State Mayors Consider Pressing Problems. Extracts from discussions at the 10th annual conference held in Schenectady. 1,600 words. American City, July, New York.

International Municipal Exposition. Permanent exposition offers great opportunities for manufacturers and affords municipal buyers chance to view most approved apparatus and appliances in their fields. 1 ill., 500 words. Fire and Water Engineering, July 30, New York.

Regional and Town Planning. Summary of problems which must be dealt with in planning a large region; regional planning in Canada. By T. Adams, housing and town planning adviser to the Canadian Government. 2,800 words. American City, July, New York.

The Community Market: Its Benefits and Influence. Utilizing local food products; closer contact of city with country. By E. B. Reid, chief of Division of Information, U. S. Dept. of Agriculture. 2 ills., 2,000 words. American City, July, New York.

Some Fallacious Arguments for Municipal Ownership. Editorial with reference to an article in American Municipalities by G. C. Long, city manager of Webster, Ia., urging municipal ownership

of electric light and power plants. 1,800 words. Engineering and Contracting, July 23, Chicago, Ill.

Altoona, Pa., Has Improved Purchasing Bureau. 600 words. Pacific Municipalities, July, San Francisco, Cal.

City Manager Movement Spreading Rapidly. 800 words. Pacific Municipalities, July, San Francisco, Cal.

Co-Operation in Public Service. Public should bear in mind that public servants are their servants. 300 words. Municipal Journal and Public Works, July 19, New York.

Advantages and Disadvantages of Various Methods of Letting Contract Work. By J. A. L. Waddell, consulting engr., Kansas City, Mo. 1 ill., 1,600 words. Engineering and Contracting, July 23, Chicago, Ill.

Suggestions for Improving Specifications. Should be easily read, of convenient size, well indexed and with serviceable covers and binding. By H. G. Payrow, sanitary engr., C. E. Dept., Lehigh University. 1,200 words. Engineering and Contracting, July 9, Chicago, Ill.

Drawing a Picture of Municipal Business. Graphic methods for city officials; map-marking devices; special chart forms; mechanical graphs; appropriation chart; photographing charts. By G. T. Swarts, Jr., C. E. 7 ills., 3,300 words. American City, July, New York.

Moving Three Large Steel Tanks 150 Miles by Water. Due to material and labor scarcity, it was cheaper to move storage tanks intact than to dismantle or build anew. By A. J. Taylor, Taylor Engrg. Co., Ltd., Vancouver, B. C. 4 ills., 800 words. Engineering News-Record, July 31, New York.

The Causes of Erosion of River Banks. Comparison with the bending of a compressed flexible. By Col. Hoc, from "Le Genie Civil," Mar. 15. 9 ills., 2,000 words. Engineering and Contracting, July 30, Chicago, Ill.

Excavation Methods on the Miami Conservancy Project. Some 21 dragline machines at work with buckets from 1-yard to 5-yd. capacity; driven mostly by electric motor. By G. L. Teeple, asst. engr., Miami Conservancy District. 4 ills., 1,500 words. Engineering and Contracting, July 16, Chicago, Ill.

How to Reduce Risks in Earthwork. Adequate plant reduces weather risk; fit plant to job; compare labor costs with machine costs. By H. P. Gillette, editor. 1,700 words. Engineering and Contracting, July 16, Chicago, Ill.

Overhead and Time Cost of Pit and Trench Excavation. By A. P. Roscoe. 900 words. Engineering News-Record, July 10, New York.

British Engineers' Reconstruction Problems. Development of labor-saving machinery and methods and dealing with the labor situation and chief problems of municipal engineers. From the Journal of the Institution of Municipal and County Engineers, by E. J. Elrod, city engr., architect and surveyor, Cardiff, Wales. 2,500 words. Good Roads, July 16, New York.

World Is On Higher Price Level. Maximum not yet reached; prices of building materials likely to increase. By T. S. Holden, investigator Economics Section, Division of Public Works and Constructive Development, U. S. Dept. of Labor. Abstract of testimony submitted to Public Utilities Committee of U. S. Chamber of Commerce. 4,500 words. Engineering and Contracting, July 16, Chicago, Ill.

Municipalities Can Lower Food Prices. Cities offered opportunity by War Department to purchase canned vegetables and meats for sale to their citizens. 200 words. Municipal Journal and Public Works, July 19, New York.

An Unusual War Record. J. W. Dapert, president of the Illinois Society of Engineers, had five sons in army in France and his daughter was in Government service in Washington. 150 words. Municipal Journal and Public Works, June 19, New York.

Harbor Facilities and Development at Houston, Tex. Ship channel converts inland city into ocean port; city provides wharves, freight sheds, warehouse, railway connections and freight-handling machinery; concrete structures. 7 ills., 2,000 words. Engineering News-Record, July 24, New York.

Maximum Temperature in Large Tunnels and Deep Wells with a Trial Empirical Formula. By F. Butavand, from "Le Genie Civil," Mar. 15. 700 words. Engineering and Contracting, July 30, Chicago, Ill.

NEWS OF THE SOCIETIES

Aug. 26-28.—LEAGUE OF CITIES OF THE THIRD CLASS IN PENNSYLVANIA. Twentieth annual convention, Allentown, Pa. Secretary, Fred H. Gates, city clerk, Wilkes-Barre, Pa.

Aug. 27-29.—VIRGINIA STATE FIREMEN'S ASSOCIATION. Thirty-third annual meeting, Charlottesville, Va. Secretary, E. K. Landis.

Sept. 30-Oct. 1-3.—NEW ENGLAND WATERWORKS ASSOCIATION. Annual meeting, Albany, N. Y. Secretary, Tremont Temple, Boston, Mass.

Oct. 27-30.—AMERICAN PUBLIC HEALTH ASSOCIATION. Annual meeting, New Orleans, La. Secretary, A. W. Hedrich, 169 Massachusetts ave., Boston, Mass.

Nov. 12-14.—AMERICAN SOCIETY FOR MUNICIPAL IMPROVEMENTS. Annual convention, New Orleans, La. Secretary, Charles C. Brown, Springfield, Ill.

American Concrete Institute.

In pre-war times the American Concrete Institute had its annual meeting in February because at that season there is less activity in the concrete field and a larger attendance is possible. Owing to the war, the February, 1918, session was postponed until June, when it was held at Atlantic City at the same time as the annual meeting of the American Society for Testing Materials. This year the Board of Directors considered it inadvisable to attempt another February meeting and therefore announced the meeting with the following program once more to be held at Atlantic City, where, through the cooperation of the officers of the American Society for Testing Materials, meeting there at the same time, one evening's joint session is possible. The other meetings of the Institute were also arranged so as not to conflict with the meetings of the other society, and an open afternoon was left on Friday so as to permit the members of the American Concrete Institute to attend the session of the American Society for Testing Materials at which was discussed the subject of cement.

Especially attention at the June meeting was once more given to the subject of concrete ships. Last year the reports were largely on what was expected to be performed. This year the engineers who have been specializing in concrete ships were able to render reports of what they have done.

The first session was held Friday, June 27, 10 a. m., the following being the program read:

Report of committee on Plain and Reinforced Concrete Sewers, W. W. Horner, chairman; report of committee on Treatment of Concrete Surfaces, J. C. Pearson, chairman; "Effect of Vibration During Placing on Strength of Concrete," D. A. Abrams; "Investigation Into the Economic Possibilities of Light Weight Aggregate in Building Construction," A. W.

Stephens; "Result of Investigation on Shear, Impact and Bond Made for Concrete Ship Studies," W. A. Slater.

In the afternoon, the members will heard papers on cement at meeting of American Society for Testing Materials.

In the evening was held the joint session with American Society for Testing Materials. The program was:

Report of A.S.T.M. Committee C-1: On Cement, R. S. Greenman, chairman; report of A.S.T.M. Committee C-9, on Concrete and Concrete Aggregates, Sanford E. Thompson, chairman; report of A.C.I. Committee on Fireproofing, W. A. Hull, chairman; A.C.I. Paper: "Later Fire Tests of Concrete Columns," W. A. Hull; A.C.I. Paper: "The Strainagraph and Its Application to Concrete Ships," F. R. MacMillan; A.S.T.M. Paper: "Effect of Fineness of Cement," D. A. Abrams; A.S.T.M. Paper: "Cements Producing Quick Hardening Concretes," P. H. Bates.

The papers at the third session Saturday morning included: Report of committee on Reinforced Concrete and Building Laws, E. J. Moore, chairman; report of subcommittee on Regulation for Strength Tests of Floors; "Plasticity and Temperature Deformation in Concrete," S. C. Hollister; report of committee on Reinforced-Concrete Highway Bridges and Culverts, A. B. Cohen, chairman.

In the afternoon were presented:

Report of committee on Concrete Roads and Pavements, H. E. Breed, chairman; Papers on Fuel Oil Tanks: Design, H. B. Andrews; Construction, H. E. Walton; Tests, J. C. Jearson; report of committee on Concrete Sidewalks and Floors, J. E. Freeman, chairman; report of committee on Nomenclature, W. A. Slater, chairman.

The Saturday evening session dealt with concrete ships.

The committee on Concrete Sewers submitted for the second time its specifications for monolithic concrete sewers and added specifications for reinforced concrete pipe sewers. The convention again returned the specifications to the committee for revision. In general, the disapproval was due to the fact that there were too many pricely contract provisions. The elimination of limestone as an aggregate was also opposed.

The Committee on Fireproofing submitted a summary of the results of recent tests on the fire resistance of concrete columns, including the paper by W. A. Hull, at the present and at last year's convention, describing tests at the Bureau of Standards, and other actual conflagration tests. The results strongly condemn gravel aggregate for fire resistance. The Committee on Nomenclature submitted some definitions and that on Roads and Pavements some revisions of the recommended prac-

tice. As these revisions were not submitted to the membership before the convention, they will not go to letter ballot but are to be printed for reference and possible action next year. They related mainly to consistency and surface finish. The Committee on Reinforced Concrete Highway Bridges and Culverts, under the new chairmanship of A. B. Cohen, of the Lackawanna Railroad, has begun work on an ambitious program toward the preparation of standard specifications for concrete highway bridges. This contemplates recommended practice on details of design, assumptions in design, general specification of materials and performance of work and methods of construction, the latter to be revised from year to year with new developments.

Two years ago the Committee on Reinforced Concrete and Building Laws presented some proposed standard building regulations for the use of reinforced concrete, which in some respects differ from the provisions of the then new "final" report of the joint Committee on Concrete and Reinforced Concrete, of which the American Concrete Institute is a member. The A. C. I. committee this year brought in a revision of these building regulations. Four medals were awarded. One of these was a special medal struck off for the institute and awarded to W. Leslie Comyn, of San Francisco, Cal., for, to quote the medal, "his faith and courage in building the first American ocean-going concrete steamship," the "Faith." The others were the Wason medals, the gift of past president Leonard C. Wason, of Boston, for the most meritorious paper presented to the institute in the year. On account of the war, the award has never been made, so three were awarded this year: for 1916, to Prof. A. B. McDaniel, for his paper, "The Effect of Temperature on the Strength of Concrete;" for 1917, to Maj. Charles W. Gow, for his paper, "The History and Present Status of the Concrete Pile Industry," and for 1918, to Prof. Duff A. Abrams, for his paper, "Effect of Time of Mixing on the Strength and Wear of Concrete."

Practically the same officers have been continued for the ensuing year, with Prof. W. K. Hatt, of Purdue University, as president. It was announced that next February the institute would return to its regular practice, broken during the war, of holding its convention in the winter, and would meet in Chicago.

American Association of Engineers.

In response to an insistent demand from engineers in the past for the American Association of Engineers to open an office in New York, a secretary has been appointed for the New York chapter. Temporary headquarters will be at 50 Church street, and the permanent address will be announced later.

(Continued on page 100.)

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

A G A HIGHWAY DANGER SIGNAL.

New Type Adapted to State Sign Regulations.

A new A G A highway danger signal designed on the same principles as the old one, already described in these pages, has been developed. The essential feature of the new type is that it conforms more nearly with the requirements as to shape and other characteristics of road signs authorized by the state legislatures.

The whole sign is made of cast iron and consists essentially of a round lamp box 30 inches in diameter. In the face of the sign are transparent letters and in the center a red $8\frac{3}{8}$ inch spread light lens through which at night an acetylene light flashes a red warning signal and at the same time illuminates the transparent letters on the sign with sharp distinctive flashes. The lamp box is mounted on a housing containing the gas cylinder, pressure gauge, pressure regulator and necessary piping. The face of the lamp box is painted red, the transparent letters are white and the rest of the sign is black. Lettering on the sign can be altered to meet require-



ments. The center of the lens is $6\frac{1}{2}$ feet above the top of the concrete pedestal on which it stands. The pedestal can be made of any height desired.

The flasher in the signal designed for railway and highway work is on the same principle as the large A G A Flasher used by the United States Government for lighthouses and buoys. The flasher is set for light characteristics most suitable for the work, $1/10$ light period and $9/10$ dark period and 60 flashes per minute. The number of flashes per minute, however, can be increased or decreased as desired. The signal operating continuously day and night consumes 0.8 cubic feet of gas per 24 hours and the 12 inch by 36 inch cylinder within the housing contains enough gas to operate the sign for eight months. The sign can be made with a single or double face as required and can be used for an advance warning to dangerous railway crossings or for bad curves and steep grades in highways.

The signal, which is shown in the accompanying illustration, is made by the A G A Railway & Signal Company, Elizabeth, N. J.

PERSONALS

Emerson, Frank C., has been appointed state engineer of Wyoming. For the past 15 years Mr. Emerson has been in charge of large irrigation enterprises in that state. At the time of becoming state engineer, in addition to a general consulting practice, he was superintendent of the Big Horn Canal Association and the Lower Hanover Canal Association, with headquarters at Worland, Wyo.

Bair, M. B., who formerly was principal assistant engineer of the division of sanitary engineering, Ohio State Department of Health, has been appointed chief engineer of the bureau of sanitation of the Arkansas State Board of Health, with offices in the state capitol at Little Rock.

Buck, Capt. W. V., of the 23rd Engineers, U. S. A., has been appointed assistant state highway engineer of Kansas. Before entering the service Mr. Buck was in charge of the construction work of A. Jaicks Co., general paving contractors, Kansas City, Mo.

Hubbard Prevost has resigned as chief of the Division of Tests and Research of the United States Bureau of Public Roads to accept the position of chemical engineer for The Asphalt Association. In his new position he

will direct the technical and research work of the association and will cooperate to the fullest possible extent with public officials, engineers, contractors and others interested in highway construction and the use of asphalt for various purposes.

INDUSTRIAL NEWS

The Sullivan Machinery Company, Chicago, Ill., announces that Phillips F. Jarvis has resigned his position as sales manager for the territory controlled from the St. Louis office. The following appointments are announced: Marion C. Mitchell has been appointed sales manager for the territory in Indiana and Illinois, previously controlled from the St. Louis office, with temporary headquarters at room No. 2006 Railway Exchange, St. Louis. Don M. Sutor, formerly manager of the El Paso office, has been appointed sales manager for the territory of western Kentucky, western Tennessee, Missouri, Arkansas, Oklahoma and Kansas (except the oil territory), with headquarters at room No. 2006 Railway Exchange, St. Louis. Daniel H. Hunter has been appointed sales manager for Louisiana, Texas (except the southwestern section), and the oil fields of Oklahoma and Kansas, with headquarters in Dallas, Texas.

NEWS OF THE SOCIETIES

(Continued from page 99.)

Kay B. Knudsen, the new secretary, was born in Chicago. He graduated from Cooper Union, New York, in 1911. About four and a half years of his experience has been on railroad work, two years on sanitary and municipal work, and one and a half years on building and construction, subway construction, and drainage work. In July, 1918, he entered military service; was promoted from the ranks to be second lieutenant, engineers, in October, after a short period of training at the E. P. T. S., and was discharged in December. For the past six months he has been employed as principal assistant engineer in the office of Alexander Potter, consulting engineer, New York.

The Oregon Society of Engineers unanimously voted at its meeting on July 24 to amalgamate with the American Association of Engineers. Other societies that expect to vote upon amalgamation in the near future are The Engineers' Club of Kansas City, The Engineers' and Architects' Association of Southern California, the Southwestern Society of Engineers and the Houston Engineers' Club. The question of amalgamation with A. A. E. has been initiated by several other societies.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STREETS AND ROADS.

- Ala., Guntersville.** 11 a.m., Aug. 26.
Grading, draining and surfacing with macadam 5.60 mi. road, involving 3 acres clearing and grubbing, 1,968 cu. yd. rock excavation, 8,600 cu. yd. stone surfacing, etc.—W. S. Keller, State Hwy. Dept., Montgomery.
- Ala., Mobile.** Aug. 30.
3½ mi. old shell road and 2¼ mi. scarifying, shaping and rolling old road, new metal foundation and paving with monolithic brick, concrete, asphaltic concrete or rock asphalt.—Co. Engr.
- Ark., Imboden.** 10 a.m., Aug. 18.
4 systems of roads, involving 60 mi. grader work, 56 acres clearing and grubbing, 137,700 cu. yd. earth excavation, 4,500 cu. yd. clearing solid rock excavation, 5,736 ft. 15 to 30-in. metal, vitrified clay or concrete pipe culverts; 1,652 cu. yd. concrete, 66,400 lb. reinforced concrete steel and 82,960 cu. yd. local crushed stone surfacing.—Pritchett & Hight, Dist. Engrs., Little Rock.
- Ark., Bentonville.** 2 p.m., Aug. 14.
Nineteen acres clearing, 115,000 cu. yd. earth excavation, 1,250 cu. yd. hand excavation, 10,000 cu. yd. rock excavation, 58,000 cu. yd. fieldstone, 28,900 cu. yd. native gravel, 3,530 lin. ft. 18 and 24-in. pipe culverts, 1,350 sq. yd. concrete paving, etc., in Benton Co.—W. L. Winters, Engr., Fort Smith.
- Ark., DeQueen.** 2 p.m., Aug. 21.
18.6 mi. gravel road, involving 24 acres clearing and grubbing, 474 rods fence removing, 107,000 cu. yd. earth work, 29,920 cu. yd. gravel, 860 ft. 12 to 24-in. culvert, bridges, etc.—Lund & Hill, Cons. Engrs.
- Ariz., Flagstaff.** Aug. 13.
Improving 4.8 mi. in Coconino Natl. Forest, Coconino Co.—J. S. Bright, Luna-Strickler Bldg., Albuquerque.
- Cal., Holtville.** Aug. 13.
252,000 sq. ft. 4-in. concrete pavement with 1½-in. warrenite surface, cement curbs, gutters, etc.—H. J. Burk, Engr.
- Colo., Denver.** Aug. 24.
Paving alley paving districts No. 50 and 51 with concrete.—J. B. Hunter, City Engr.
- Del., Georgetown.** 1 p.m., Aug. 19.
3.4 mi. involving 0.9 acres clearing and grubbing, 12,500 cu. yd. excav., 5,500 cu. yd. borrow, 250 lin. ft. rein. concr. pipe, 350 lin. ft. relaid pipe, 4,675 tons slag for macadam or 4,900 cu. yd. cement concr. roadway, 110 joints, etc.; 2.3 mi. involving 4.5 acres clearing and grubbing, 11,000 cu. yd. excav., 4,000 cu. yd. borrow, 246 lin. ft. 15 to 24-in. rein. concr. pipe, 3,200 tons slag for macadam or 3,300 cu. yd. cement concr. roadway, 90 joints, etc.; 4.85 mi. involving 16,400 cu. yd. excav., 300 lin. ft. 15 to 24-in. rein. concr. pipe, 6,850 tons slag for macadam or 6,940 cu. yd. cement concr. roadway, 170 joints, etc.; 4.92 mi. involving 12,000 cu. yd. excav., 1,200 cu. yd. borrow, 214 lin. ft. 12 to 24-in. rein. concr. pipe, 6,740 tons stone for macadam or 6,060 cu. yd. cement concr. roadway, 110 joints, etc., all in Sussex County.—C. M. Upham, Chief Engr., State Hwy. Dept., Dover.
- D. C., Washington.** 2 p.m., Aug. 14.
Resurfacing asphalt pavements for 1-year period, involving 20,000 sq. yd. standard asphalt pavement on 6-in. concrete base, 25,000 sq. yd. standard asphalt surface (2½ in. before compression), 35,000 cu. ft. asphalt binder.—Chf. Clk., Engr. Dept., 427 District Bldg.
- Ind., Shelbyville.** 10 a.m., Aug. 13.
10,000 ft. stone road on county line between Decatur and Shelby counties.—F. W. Fagel, Co. Aud.
- Ind., South Bend.** 10 a.m., Aug. 18.
33,965.3 ft. concrete road in Clay and Harris Twps.—A. F. Wolf, Co. Aud.
- Ind., Indianapolis.** 10 a.m., Aug. 13.
Improving six city streets by grading, paving, resurfacing, etc.—Bd. Pub. Wks.
- Ind., Crown Point.** 1 p.m., Aug. 25.
Two gravel roads in Calumet and Hobart Twps.—G. M. Foland, Co. Aud.
- Ind., Evansville.** 10 a.m., Aug. 14.
Two roads in Perry Twp., one in Union and one in Knight Twp.—W. Copeland, Co. Aud.
- Ind., Noblesville.** 10 a.m., Aug. 16.
Five gravel roads in Washington, Jackson and Clay Twps.—H. O. Cottingham, Co. Aud.
- Ia., Kingsley.** 2 p.m., Aug. 14.
46,000 sq. yd. paving.—W. R. Payne, Town Clk.
- Mass., Great Barrington.** 4 p.m., Aug. 11.
Paving street with cement concrete, involving 1,527 cu. yd. excavation, 296 cu. yd. fill, 1,560 cu. yd. concrete.—Town Clk.
- Mass., Boston.** noon, Aug. 12.
1,150 ft. asphalt road in Danvers and 2,450 ft. oil road in Hadley.—F. I. Bieler, Secy., State Hwy. Comm.
- Mich., Kalamazoo.** 1.30 p.m., Aug. 12.
5,878 mi. grading, draining and surfacing with concrete or bituminous concrete.—F. F. Rogers, State Hwy. Comm., Lansing.
- Minn., Faribault.** 2 p.m., Aug. 19.
14.4 mi. fed. aid projects Nos. 68, 69 and 77 in Rice Co., involving 99,039 cu. yd. excav., 17,407 cu. yd. gravel surface, furnishing and installing 520 lin. ft. 15-in. and 698 lin. ft. 18-in. portable culverts, 137 cu. yd. standard concr. culverts.—F. M. Kaisersatt, Co. Aud.
- Minn., Brainerd.** 2 p.m., Aug. 23.
3.7 mi. fed. aid proj. No. 73, involving 3 acres clearing and grubbing, 19,000 cu. yd. grading, 13,000 cu. yd. overhaul, 5,000 lin. ft. scarifying macadam road, 1,000 lin. ft. drain tile, 662.5 ft. 12 to 24-in. portable culvert, 39,400 sq. yd. concr. paving, etc.; also 7.1 mi. fed. aid proj. No. 51, involving 39 acres clearing and grubbing, 46,339 cu. yd. grading, 4,950 cu. yd. overhaul, 3,450 lin. ft. guard rail, 32,600 lin. ft. shaping and compacting gravel haul, etc., both projects in Crow Wing Co.—C. W. Mahlum, Co. Aud.
- Minn., Plainview.** 8 p.m., Aug. 12.
2,800 lin. ft. combined concrete curb and gutter.—M. T. Duerre, Vil. Rec.
- Minn., Pine City.** 1 p.m., Aug. 18.
3½ mi. State Rd. No. 5, involving grubbing, grading, installing culverts and offtake ditching.—A. P. Edin, Co. Aud.
- Minn., Warren.** 2 p.m., Aug. 15.
Federal Aid Project No. 81, involving loading and unloading gravel, reshaping 138,732 lin. ft. roadbed, 17,000 cu. yd. excavation and 12,000 cu. yd. overhaul, 674 lin. ft. 15 to 30-in. circular concrete culverts, 390 lin. ft. 12 to 30-in. corrugated metal or circular concrete culverts, graveling, etc.—A. G. Lundgren, Co. Aud.
- Mo., St. Louis.** Noon, Aug. 26.
Paving street with bitulithic pavement and granite curb.—E. R. Kinsey, Pres., Bd. Pub. Serv.
- Neb., Beaver City.** Aug. 12.
Nineteen mi. grading and culverts on 24-ft. road in Furnas Co., involving 1,575 sq. yd. concrete and 148,000 cu. yd. earth excavation, etc.—G. E. Johnson, State Hwy. Engr., Lincoln.
- Neb., Hastings.** Aug. 14.
Eleven mi. grading, paving and culverts on 24-ft. road in Adams Co., involving 815 sq. yd. concrete, 88,000 cu. yd. earth excavation; 27 mi. road, involving 223,000 cu. yd. earth excavation.—G. E. Johnson, State Hwy. Engr., Lincoln.
- Neb., McCook.** Aug. 13.
Seventeen mi. grading and culverts on 24-ft. road, involving 3,617 sq. yd. concrete and 139,000 cu. yd. earth excavation.—G. E. Johnson, State Hwy. Engr., Lincoln.
- N. J., Camden.** 11 a.m., Aug. 11.
7,715.5 sq. yd. bituminous surface on concrete foundation on King's Hwy. in Camden Co.—J. J. Albertson, Co. Engr.
- N. J., Elizabeth.** 8.15 p.m., Aug. 13.
3,253.6 lin. ft. concrete sidewalks and 1,664 cu. yd. excavation in Hillside Twp.—Wm. H. Luster, Twp. Engr., 286 North Broad St.
- N. J., Jersey City.** Aug. 14.
Repairing road with granite block.—T. J. Wasser, Engr., Court House.
- N. J., Trenton.** Aug. 13.
Improving 41,460 sq. yd. road in Mercer and Monmouth Cos. with gravel surface.—G. D. Cooper, Red Bank, and H. Harris, Trenton, Engrs.
- N. J., Paulsboro.** 8 p.m., Aug. 11.
10,200 sq. ft. concrete gutters and 2,600 sq. ft. concrete pavement at street intersections.—D. D. Pote, Boro. Clk.
- N. J., Salem.** 11 a.m., Aug. 17.
Road work.—H. B. Keasby, Engr.
- N. Y., Albany.** 1 p.m., Aug. 26.
Improving highways in following counties: 7.33 mi. in Montgomery, 1.27 mi. in Rensselaer, 9.06 mi. in Saratoga and 5.86 mi. in Suffolk Cos.; also completing highways in following counties: 11.50 mi. in Cayuga, 5.65 mi. in Chautauqua, 10.36 mi. in Franklin, 8.34 mi. in Livingston, 12.19 mi. in Madison, 6.36 mi. in Oswego, 2.13 mi. in Seneca, 10.24 mi. in Ulster and 2.06 mi. in Washington Cos., and also completing road repair in Cortland Co.—F. S. Greene, State Hwy. Comm.
- N. Y., Albany.** 3 p.m., Aug. 11.
Improving streets, including grading, building receiving basins, repairing or constructing culverts, laying drains, paving with concrete, paving with new vitrified hillside block or second-hand vitrified block on concrete foundation, concrete curbs, guard fences, etc.—I. Wachsmann, Secy., Bd. Contr. & Supply.
- N. Y., New York.** 11 a.m., Aug. 15.
Grading, curbing and laying sidewalks, and paving with sheet asphalt on 6-in. concrete foundation; paving with asphalt block on concrete foundation; grading, curbing and laying sidewalks and gutters; curbing, laying sidewalks and paving with sheet asphalt on 6-in. concrete foundation; grading, curbing and laying sidewalks on a number of streets in Boro. of Queens.—M. E. Connolly, Pres., Boro. of Queens.
- N. Y., New York.** 2 p.m., Aug. 11.
Regrading and repaving with granite block on concrete foundation.—F. L. Dowling, Pres., Boro. of Manhattan.
- N. Y., Seneca Falls.** 8 p.m., Aug. 15.
Paving streets, involving 12,195 sq. yd. rein. concr. pavement, with integral curb; 1,161 sq. yd. brick pavement; 1,100 lin. ft. concr. curb and gutter, and 5,488 cu. yd. earth excav.—C. W. Combs, Vil. Clk.
- N. Y., New York.** 11 a.m., Aug. 13.
Repaving with permanent grade one granite pavement on 6-in. concrete foundation and repaving with permanent asphalt pavement on 6-in. concrete foundation in Brooklyn.—E. Riegelmann, Pres., Boro. of Brooklyn.

BIDS ASKED FOR

- N. C., Monroe.** noon, Aug. 11.
4.29 mi. state highway in Union Co., involving 11,078.7 cu. yd. common or earth excavation, 1,050 lin. ft. double-strength vitrified culverts, 10,500 lbs. reinforcing steel, etc.—W. S. Fallis, State Hwy. Engr., Raleigh.
- N. C., Washington.** 2 p.m., Aug. 12.
Paving highways in Beaufort Co., involving 270,000 sq. yd. asphalt, bitulithic, concrete, brick or other pavement; 150,000 cu. yd. grading and ditching, 5,000 lin. ft. pipe drains, 1,500 lin. ft. box culverts, 820 cu. yd. bridge concrete, 150,000 lb. reinforcing bars; also improving city streets, involving 51,000 sq. yd. asphalt, bitulithic, concrete, brick or other pavement; 30,000 lin. ft. granite or concrete curb, 30,000 lin. ft. concrete gutter, 20,000 sq. yd. sidewalk, 18,000 cu. yd. grading, 2½ mi. storm drains, 3 mi. water pipe and 1 mi. sanitary sewer.—G. C. White, Engr., Durham.
- O., Cleveland.** Aug. 15.
9½ mi. asphaltic concrete on Wooster Pike and 1 mi. in Bedford resurfaced with brick.—N. A. Stinchcomb, Engr.
- O., Toledo.** noon, Aug. 19.
Improving streets with concrete or vitrified brick, asphalt or creosoted wood blocks on concrete foundation with necessary curbing, headers, drainage, grading, installing sewer connections, etc.—D. H. Goodwillie, Dir. Pub. Serv.
- O., Columbus.** noon, Aug. 19.
Grading, draining, curbing, repaving roadway with asphalt or brick, laying water service pipe and sewer connections.—G. A. Borden, Dir. Pub. Serv.
- O., Columbus.** noon, Aug. 18.
Furnishing 60 tons refined asphalt, 80 tons limestone dust, 400 tons lake sand, 2,200 tons bank or river sand, 150,000 old style paving blocks, 200,000 standard paving blocks, 300 tons paving pitch, 5,000 tons crushed stone and dust, 500 bbls. Portland cement, 20,000 gal. asphalt road oil, etc.—H. Maetzel, Chief Engr.
- O., Oxford.** Aug. 15.
Paving and curbing ½ mi. 33-ft. roadway, involving 10,000 sq. yd. vitr. brick and 5,200 lin. ft. curbing.—L. A. Boulay Co., 1250 Nicholas Bldg., Toledo, Engrs.
- O., North Bend.** Aug. 15.
2,150 ft. road improvement in Hamilton Co.—A. E. Mittendorf, Pres. Co. Comrs.
- O., Cincinnati.** noon, Aug. 15.
Repairing road and resurfacing road in Colerain Twp.—A. Reinhardt, Clk., Bd. Co. Comrs.
- Pa., Scranton.** 10.30 a.m., Aug. 11.
Laying 4-ft. flagstone sidewalks, widening and improving street and constructing storm sewer, and furnishing two steel asphalt storage tanks of 8,000 gal. capacity each, equipped with sufficient coils to melt asphalt for pumping, with all necessary connections for both steam and asphalt service.—Bureau of Engrs., Dept. Pub. Wks.
- Pa., Williamsburg.** Aug. 15.
Paving and curbing 1 mi. streets with vitr. brick or 7-in. 2-course concr. on concr. foundation.—J. Luden Henry, Engr., 528 Walnut St., Hollidaysburg.
- Pa., Waynesburg.** 1.30 p.m., Aug. 18.
Reconstructing 3,125.4 lin. ft. rein. pavement from 16 to 30 ft. wide in borough of Carmichaels, Greene Co.—Co. Comrs., Court House.
- Pa., Waynesburg.** 1.30 p.m., Aug. 18.
Reconstructing 29,567.6 lin. ft. rein. concr. and vitr. brick pavement 16 ft. wide in Greene Co.—T. B. Dinsmore, Co. Engr., Peoples Bank Bldg.
- Pa., Connelville.** Aug. 13.
7,335 ft. concrete road 18 ft. wide, 1,927 ft. concrete foundation and curb with brick-wearing surface.—H. Kissinger, Contr., Fayette Co.
- Pa., Mount Union.** 8 p.m., Aug. 11.
21,400 sq. yd. vitrified paving block on concrete base or two-course reinforced concrete paving, 6,000 cu. yd. excavation, and 15,000 lin. ft. cement curbing.—D. W. Dillman, Boro. Engr., 80-81 Altoona Trust Bldg., Altoona.
- Pa., Meadville.** 5 p.m., Aug. 12.
34,513 sq. yd. brick pavement and 24,518 lin. ft. concrete curb and gutter.—City Engr.
- Pa., Harrisburg.** 10 a.m., Aug. 19.
Reconstructing pavements in following counties: 21,299 lin. ft. reinforced concrete in Allegheny Co.; 11,640 ft. reinforced concrete in Armstrong Co.; 56,111 ft. reinforced concrete in Bedford Co.; 312 ft. vitrified brick in Bucks Co.; 13,232 ft. reinforced concrete and hillside brick in Cambria Co.; 5,651 ft. reinforced concrete in Carbon Co.; 29,232 ft. bituminous macadam on Telford foundation in Chester Co.; 7,314 ft. bituminous surface course on Telford foundation in Delaware Co.; 4,101 ft. vitrified brick in Fayette Co.; 71,063 ft. bituminous surface course on concrete foundation or reinforced concrete in Lackawanna and Wyoming Cos.; 16,213 ft. reinforced concrete in Lehigh Co.; 31,413 ft. bituminous surface course on concrete foundation or reinforced concrete in Luzerne Co.; 15,683 ft. bituminous surface course on concrete foundation or reinforced concrete in Mercer Co.; 8,286 ft. reinforced concrete in Northampton Co.; 2,431 ft. reinforced concrete in Mercer Co.; 22,237 ft. reinforced concrete in Washington Co. and 89,002 ft. reinforced concrete and Hillside brick in Westmoreland Co.—L. S. Sadler, State Hwy. Comr.
- Pa., Johnstown.** 5 p.m., Aug. 13.
Grading, paving with brick on concrete base or one-course reinforced concrete construction in a number of streets.—Owen & Plummer, Inc., Otto Bldg.
- S. C., Charleston.** 11 a.m., Aug. 12.
Surfacing 3 mi. with asphaltic, concrete or warrenite pavement.—Co. Engr.
- S. D., Redfield.** 2 p.m., Aug. 22.
Improving state highway in Grant Co., involving 12 sq. rds. clearing and grubbing, 46,340 cu. yd. earth excavation, 4,820 yd. street overhaul and excavation, 1,520 lin. ft. corrugated metal pipe from 12 to 24-in., 266.44 cu. yd. concrete, 11,560 lbs. steel reinforcement, etc.; also completing portion of state highway in Brown Co., involving 28,708 cu. yd. earth excavation, etc.—Inter-State Surety Co.
- S. D., Huron.** 1 p.m., Aug. 18.
26,650 sq. yd. reinforced concrete, plain concrete, asphaltic concrete, tarvia concrete or bitulithic pavement in four streets; also 3,024 sq. yd. one-course plain concrete pavement in three alleys.—O. A. Ricker, City Engr.
- Tex., Abilene.** Aug. 16.
Gravel surfacing and building concrete drainage structures on 4.69 mi. State Aid Project No. 80, involving 18,187 lin. ft. grading, etc.—H. E. Elrod, 505 Interurban Bldg., Dallas, Engr.
- Tex., Granbury.** 10 a.m., Aug. 15.
6 mi. waterbound macadam highway with bituminous surface from Erath County line to Tolar, in Hood County, including drainage structures, clearing and grubbing, etc.—Burks, Firman & Hart.
- Utah, Farmington.** Aug. 15.
76,500 sq. ft. 4-in. and 5,700 sq. ft. 5-in. concrete sidewalks.—Caldwell & Richards, Vermont Bldg., Salt Lake City, Engrs.
- Wash., Olympia.** 2 p.m., Aug. 18.
Improving one mi. permanent highway No. 8, involving clearing, grading and draining and constructing concrete bridge.—State Hwy. Comr.
- W. Va., Logan.** Aug. 12.
1.3 mi. concrete road 16 ft. wide.—J. W. McClared, Engr.
- W. Va., Ripley.** Aug. 15.
Surfacing 1.06 mi. streets in Ravenswood Twp., 20 ft. wide, involving 3,500 cu. yd. excav., 12,500 sq. yd. cement concr. surfacing, sewers, drains, curbs, etc.; also 5 mi. 20-ft. road involving 4,100 sq. yd. concr. surface and 500 cu. yd. excav.—T. A. Bragonier, Engr.
- W. Va., Morgantown.** noon, Aug. 23.
4.5 mi. 16-ft. 1-course reinforced concrete pavement.—J. M. Gregg, Co. Clk.
- W. Va., St. Albans.** 2 p.m., Aug. 16.
7,200 sq. yd. paving, 2,900 lin. ft. curb and gutter, 100 lin. ft. edging, 50 lin. ft. tile laid and 2,900 cu. yd. excavation.—Oliver & Maupin, Engrs., Huntington.
- W. Va., Charleston.** Aug. 12.
Paving three mi. road in Kanawha Co. with asphaltic concrete, topeka mix or similar pavement on concrete base.—F. G. Burdette, Engr.
- Wis., Richland Center.** Aug. 12.
400 cu. yd. grading and 3,024 sq. yd. reinforced concrete pavement.—G. C. Luckey, City Clk.
- W. Va., Princeton.** noon, Aug. 27.
Grading 18-ft. road in Mercer Co.—Co. Engr.
- D. C., Washington.** 3 p.m., Aug. 15.
37,000 ft. 6-in., 26,000 ft. 8-in. and 2,000 ft. 12-in. cast iron water main, 8,500 ft. 1½-in. to 2½-in. galvanized wrought steel temporary water main and 10,000 ft. ¾-in. and 1-in. galvanized wrought iron house service pipes.—R. B. Morse, Chief Engr., Washington Suburban Sanitary Dist., Hyattsville, Md.
- Ga., Cartersville.** 2 p.m., Aug. 20.
16 mi. sanitary sewers, from 8 to 15-in., with necessary appurtenances.—J. B. McCrary Co., Atlanta.
- Ind., Indianapolis.** 10 a.m., Aug. 13.
Local sewer in city street.—Bd. Pub. Wks.
- Ind., Elwood.** Aug. 15.
Sanitary sewer.—J. Seright, Engr.
- Ind., Indianapolis.** 10 a.m., Aug. 21.
Pumping machinery and equipment for Div. 2 of sewage disposal plant, involving 3 electric motor-driven centrifugal pumping units with 25 million gal. daily capacity, 3 electric motor-driven centrifugal pumping units with 15 million gal. daily capacity; mechanically operated sewage screens with 100 million gal. daily capacity; electrically operated locomotive crane complete with bucket and attachments.—F. C. Lingenfelter, Pres. Bd. Sanitary Comrs.
- Mass., Longmeadow.** 8 p.m., Aug. 12.
Laying 482 lin. ft. 18-in., 2,130 lin. ft. 12-in., 556 lin. ft. 10-in. and 510 lin. ft. 8-in. pipe, 19 manholes and 17 catchbasins, and 12,773 sq. yd. macadam pavement.—Durkee, White & Towne, Engrs., 17 Hampden St., Springfield.
- Minn., Milaca.** 8.30 p.m., Aug. 15.
District sewer and water main sewer district No. 2, involving 1,150 lin. ft. 18-in. standard salt glazed sewer tile, and 1,130 lin. ft. 6-in. Class D standard cast iron water main and five concrete manholes, etc.—J. D. Gray, Engr.
- Miss., Lambert.** 10.30 a.m., Aug. 12.
1,400 ft. 12-in., 4,400 ft. 10-in. and 7,100 ft. 8-in. sewers, 23 manholes and 3 flush tanks.—H. D. Glass, Co. Clk.
- Mo., Kansas City.** 2 p.m., Aug. 19.
Constructing Turkey Creek sewer, two sewage pumping stations, laterals and extensions of existing sewers, consisting of 1.2 mi. main sewer of reinforced concrete and 3¼ mi. laterals and extensions of concrete, segment blocks or clay pipe.—A. D. Ludlow, Engr. of Sewers, City Hall.
- Mo., Clayton.** 4 p.m., Aug. 12.
St. Louis Co. joint sanitary sewer district No. 1.—L. C. Dziatzko, Special Sewer Engr., St. Louis Joint Co. Sanitary Sewer Dist.
- N. J., Hackensack.** 8 p.m., Aug. 18.
Disposal works, flotation basins, power house, power transmission lines, air lines, force mains, ejectors, ejector stations, etc.; pipe, concrete and other sewers, involving 101,450 lin. ft., with manholes, catch basins and other equipment.—L. Lozier, Engr., Hackensack Impvt. Comm., Bank Bldg., Main and Mercer Sts.
- N. Y., New York.** 2 p.m., Aug. 11.
Constructing and reconstructing sewers in city streets.—F. L. Dowling, Pres., Boro. of Manhattan.
- N. D., Bismarck.** Aug. 11.
Sanitary sewers, involving 530 lin. ft. 8-in. vitrified pipe, etc.—C. L. Burton, City Aud.
- O., Ironton.** noon, Aug. 12.
Sanitary sewers in two streets.—F. A. Rose, Clk. of Serv. Dir.
- O., Toledo.** noon, Aug. 19.
Sanitary sewers in two streets.—D. H. Goodwillie, Dir. Pub. Serv.
- O., Columbus.** noon, Aug. 18.
Furnishing 1,900 lin. ft. 4 to 20-in. vitrified sewer pipe, Y's, T's, inlets, curves, etc., 60 catchbasin traps, 20 manhole castings, 50 manhole ground rims, 150 manhole lids, 20 catchbasins complete, 50 catchbasin ground rims, 250 catchbasin tops, 100 catchbasin lids, etc.—H. Maetzel, Chf. Engr.
- O., Columbus.** noon, Aug. 19.
Laying sewers in two city streets.—G. A. Borden, Dir. Pub. Serv.
- Pa., Erie.** 11 a.m., Aug. 12.
Constructing two sections of Garrison Run Improvement.—F. G. Lynch, City Engr.
- S. C., Batesville.** Aug. 15.
Constructing sewers.—M. E. Rutland, Mayor.

SEWERAGE.

- Conn., Thompsonville.** Aug. 19.
Constructing sewer, involving 1,350 ft. 15-in., 1,650 ft. 12-in., 1,125 ft. 10-in. and 1,900 ft. 6-in. tile and 16 manholes.—W. J. Hines, Supt. Sewer Comn.

BIDS ASKED FOR

FIRE EQUIPMENT.

Wis., Milwaukee. 10.30 a. m., Aug. 12.
House drains and water service connections.—P. Braman, Deputy Comr. Pub. Wks.

W. Va., South Charleston. 5 p. m., Aug. 15.
50,000 ft. sewer, 8 to 36 or 45 in. in diameter, including excavation, back-filling, placing concrete, brick work, iron castings, sheeting, bracing, vitrified tile pipe, etc.—Pearse & Greeley, Engrs., 39 W. Adams St., Chicago, Ill.

Wis., Appleton. 4 p. m., Aug. 20.
Sewers in city street.—E. L. Williams, Clk.

WATER SUPPLY.

Cal., San Francisco. 8 p. m., Aug. 13.
One or more gasoline motor-driven pumping engines.—F. T. Kennedy, Secy.

D. C., Washington. 3 p. m., Aug. 13.
Furnishing 50,000 ft. 6-in., 45,000 ft. 8-in. and 2,200 ft. 12-in. cast-iron water pipe, and 65 tons special castings; 250 gate valves, 6 to 12-in.; 10,000 ft. ¾-in., 5,000 ft. 1-in., 1,000 ft. 1½-in. 500 ft. 1½-in. and 500 ft. 2-in. galvanized genuine wrought iron pipe; 1,350 ¾-in. to 2-in. corporation cocks and goose necks.—R. B. Morse, Chf. Engr., Washington Suburban Sanitary Comm., Hyattsville, Md.

D. C., Washington. Aug. 19.
Furnishing 342 tons 8-in. cast-iron water pipe and 32 tons special water pipe.—Dist. Comrs., Dist. Bldg.

Mass., North Truro. 2 p. m., Aug. 12.
Repairing driven well.—U. S. Government Lighthouse, Boston.

Minn., St. Paul. 2 p. m., Aug. 14.
Water supply system, sewage disposal system and underground heating distribution system for state sanatorium.—C. L. Pillsbury Co., Engrs.

Minn., Dumont. 7.30 p. m., Aug. 15.
Improving water works system.—W. C. Buck, Engr., Minneapolis.

N. J., East Orange. 8 p. m., Aug. 11.
Furnishing 35 tons 6 and 8-in. cast iron pipe, laying 6 and 8-in. cast iron pipe.—Bd. Water Comrs., 434 Main St.

N. J., South Orange. 8 p. m., Aug. 11.
Curbing, paving and constructing storm water sewer.—I. T. Redfern, Vil. Engr.

O., Akron. 10 a. m., Aug. 12.
Completing sewer district in Summit Co.—Bd. Co. Comrs.

O., Nat'l Military Home. 1 p. m., Aug. 29.
Furnishing one compound duplex Smith-Vaile pump, 5 million gal. capacity, size 24x36x18 in.; semi-rotative steam valves, water plunger, fibrous packed steel piston rods; two 125-h. p. R. T. Brownell boilers; three 100-h. p. Stillwell open heaters.—Capt. J. E. Gimperling, Quartermaster.

O., Wickliffe. Aug. 12.
Water mains in various streets.—F. A. Pease Engr. Co., 806 Marshall Bldg., Cleveland.

Pa., Shenandoah. 10 a. m., Aug. 19.
Furnishing and setting 2 centrifugal pumps of 2 m. g. d. each, with motors; furnishing and installing 1 deep well pump of 200 g. p. m. capacity, with motor; pumping stations, transformer house, transformers, transmission line, switchboard, piping, ditching, valves, etc.—Gannett, Seelye & Fleming, Engrs., Harrisburg.

S. D., Armour. 9 p. m., Aug. 20.
One 80,000-gal. steel water tank and 110-ft. tower, 1,906 ft. 4 to 10-in. cast iron water main, 2,550 ft. ¾-in. lead service pipe.—P. Felton, City Aud.

LIGHTING AND POWER.

N. J., Passaic. 10 a. m., Aug. 11.
Lighting city streets for period of five years, involving 305-2,000-c. p. arc lamps, one 1,200-c. p. arc lamp, one 100-c. p. incandescent lamp, six 600-c. p. incandescent lamps and 135 single-mantle Welsbach incandescent gas street lamps.—Z. A. Van Houten, City Clk.

Ecuador. Sept. 1.
Electric light and power plant.—File No. 119,670, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Sask., Saskatoon. Sept. 23.
Steam turbine, alternating current, generator, switch gear equipment, surface condenser and condenser auxiliaries.—C. J. Yorath, City Comr.

Md., Cumberland. 9.30 a. m., Aug. 18.
One four-wheeled tractor to motorize aerial ladder truck.—T. A. K. Hummelshime, Cor. Police and Fire.

Minn., St. Paul. 10.30 a. m., Aug. 11.
10,000 ft. 2½-in. cotton-covered fire hose.—H. W. Austin, Purch. Agt.

N. J., New Brunswick. 10 a. m., Aug. 15.
Furnishing 1,000 ft. 2½-in. double jacket fabric fire hose with couplings.—W. C. Jacques, Dir. Dept. Pub. Safety.

Pa., Allentown. 9 a. m., Aug. 20.
Furnishing one gasoline motor-driven, two-wheel, front-drive, 75-ft. aerial hook and ladder truck; six gasoline motor-driven 500 to 600-gal. and six 750 to 800-gal. pumping engines and hose car combined; three gasoline motor-driven double 40-gal. chemical engines and hose car combined.—City Mayor.

BRIDGES.

Ala., Birmingham. Aug. 15.
Two concrete bridges and removal of steel bridge.—Co. Engr.

Ala., Birmingham. noon, Aug. 15.
Reinforced concrete arch bridge, 100-ft. span over Rock Creek in Jefferson Co.—S. R. Batson, Co. Hwy. Engr., 417 Jefferson Co. Bank Bldg.

D. C., Washington. 2 p. m., Aug. 19.
Reconstructing portion of canal wall west of Aqueduct bridge.—Chf. Clk., Engr. Dept., 427 District Bldg.

Ga., Statesboro. 2 p. m., Aug. 19.
Seven bridges in Bulloch Co., involving 1,792.7 cu. yd. common excavation, 2,827.3 cu. yd. borrow excavation, 1,016.47 cu. yd. Class A concrete, 1,864 lin. ft. 14x14 reinforced concrete piles, 444 lin. ft. 10x10 reinforced concrete piles, 98,252 lbs. steel, 1,088.02 sq. yd. 12-in. carpet coat sand asphalt, 1,508.3 cu. yd. sand-clay surfacing, etc.—J. B. McCrary Co., Third Natl. Bank Bldg., Atlanta.

Ga., Thomasville. 4 p. m., Aug. 22.
Bridge over Ochlocknee River.—J. B. McCrary Co., Engrs., Atlanta.

Ga., Thomaston. Sept. 3.
Bridge over Flint River, two 120-ft. steel truss spans, 12-ft. roadway.—Comrs. Roads and Revenues, Upson Co.

Ga., Swainsboro. 2 p. m., Aug. 20.
Bridge in Emanuel Co. of reinforced concrete, involving 6,720.8 cu. yd. borrow, 932.97 cu. yd. concrete, 2,232 lin. ft. 14x14 reinforced concrete piles, 135 lin. ft. 10x10 reinforced concrete piles, 1,176.90 sq. yd. half-in. carpet-coat sand asphalt, etc.—J. B. McCrary Co., Engrs., Atlanta.

Ga., LaGrange. Aug. 26.
Two reinforced concrete bridges.—Garrett & Sleek, Bell Bldg., Montgomery, Ala., Proj. Engrs.

Ill., Hazelhurst. 9.30 a. m., Aug. 14.
Three concrete bridges over Elkhorn Creek and 15 concrete culverts in Ogle and Carroll Cos.—A. Anderson, Polo, or S. C. Campbell, Mt. Carroll, Supts. of Hwys. of Ogle and Carroll Cos., respectively.

Ill., Chicago. 11 a. m., Aug. 12.
Substructure of double-leaf trunnion bascule bridge over Chicago River.—C. R. Francis, Comr. Pub. Wks.

Minn., Duluth. Aug. 12.
Eight bridges in St. Louis Co.—W. H. Borgen, Co. Aud.

Minn., Pine City. 1 p. m., Aug. 18.
Three reinforced concrete bridges.—A. P. Edin, Co. Aud., Pine Co.

N. J., Trenton. 10.30 a. m., Aug. 20.
4 rein. concr. bridges in Camden Co.—A. L. Grover, Chief Clk., State Hwy. Comm.

N. Y., Albany. noon, Aug. 12.
Completing 2 concrete bridges over Red Creek in Genesee Valley Park, Rochester; constructing substructure, superstructure and approaches of highway bridge across barge canal below Lock 28-A, Lyons, N. Y.—E. S. Walsh, Supt. Pub. Wks., Capitol.

N. C., Fayetteville. 3 p. m., Aug. 15.
Rein. concr. or beam bridge with concr. floor.—E. C. Derby, City Engr.

O., Bryan. Aug. 19.
Bridge in Pulaski Twp.—C. R. Lowe, Clk. Co. Comrs.

O., Lancaster. Aug. 15.
Three concrete bridges.—H. C. Roller, Fairfield Co. Aud.

O., Toledo. Aug. 19.
Three culverts in Lucas Co.—Gabe Cooper, Co. Aud.

O., Willoughby. Aug. 25.
Reinforced concrete viaduct and approaches over Chagrin River.—W. J. Watson and W. P. Brown, Engrs., 1101 Hippodrome Bldg., Cleveland.

Pa., Harrisburg. 10 a. m., Aug. 18.
Thirteen bridges in Armstrong Co., eight in Berks Co., six in Cameron Co., one in Clarion, three in Clearfield, one in Columbia, two in Crawford, two in Erie, two in Fayette, two in Indiana, two in Jefferson, three in Lehigh, four in Monroe, one in Montgomery, one in Pike, Schuylkill and Sullivan Cos., five in Susquehanna Co., one in Venango, Warren and Wayne Co., and five bridges in Wyoming Co., 66 in all.—L. S. Sadler, State Hwy. Comr.

Pa., Huntingdon. 11 a. m., Aug. 18.
2 rein. concr. bridges, 50-ft. span, in Huntingdon Co.—J. Murray, Africa Co., Engrs.

Pa., Scranton. 10.30 a. m., Aug. 11.
Repairing bridge on road from Dalton to Wallsville in Lackawanna Co.—C. P. Savage, Co. Contr., Court House.

Tex., Beeville. 2 p. m., Aug. 12.
Reinforced concrete box culvert bridge over Paesta Creek in Bee Co.—Co. Clk.

Wis., Richland Center. Aug. 12.
Reinforced concrete bridge, 80-ft. span.—G. C. Luckey, City Clk.

Wis., West Bend. Aug. 12.
120-ft. reinforced concrete and steel bridge with two 40-ft. girder spans, 30-ft. roadway, 6-ft. sidewalks and earth approach and fill.—Parsons & Orbert, Engrs., 627 M. & M. Bank, Milwaukee.

Dominican Republic, Santo Domingo. 10 a. m., Sept. 30.
Rein. Concr. bridge and approaches over the Rio Yaque del Sur in the Province of Azua, consisting of 2 rein. concr. arches 91 ft. span each, and 4 slab spans 22 ft. each, 304 ft. long and 18 ft. 9 in. wide.—Dir. Gen. Pub. Wks.

MISCELLANEOUS.

D. C., Washington. 10.30 a. m., Sept. 2.
Cargo handling cranes, air compressors, electric motor and spares, starting panels, motor-driven triplex pump, Hamilton-Corliss engine, fiber conduit bends, steel dump cars, etc.—A. L. Flint, Gen. Purch. Agt., Panama Canal.

Id., Sibley. 10.30 a. m., Aug. 18.
Two highway drains, involving 11,250 ft. 6 to 18-in. tile; average haul, three and two miles.—D. W. Clayton, Co. Aud.

Ky., Addison. Noon, Aug. 27.
Lock and abutment for dam No. 45, Ohio River.—U. S. Engr. Office, Louisville.

Minn., Alexandria. 10 a. m., Aug. 28.
One gravel loading apparatus with bin, etc., and one 8 to 12-h. p. engine to operate same.—V. Thomas, Co. Aud.

Minn., Granite Falls. 2 p. m., Aug. 28.
Judicial Ditch No. 2, involving 747,380.4 cu. yd. excavation and 190,200 ft. 6 to 26-in. tile, etc.—G. H. Wilson, Co. Aud.

Minn., Hastings. 2 p. m., Aug. 18.
Furnishing mechanical loader for loading gravel from pits into auto trucks.—R. W. Downs, Co. Aud.

Miss., Clarksdale. Sept. 1.
Furnishing one light and one heavy farm tile ditcher.—R. T. Collier, Drainage Engr.

N. Y., Albany. noon, Aug. 12.
Completing excavation of canal between Crocker's Reef and Fort Edward.—E. S. Walsh, Supt. Pub. Wks., Capitol.

N. Y., New York. noon, Aug. 15.
Bulkhead platform between 79th and 80th Sts., East River, Manhattan, and depositing rip rap.—M. Hulbert, Comr. of Docks.

N. Y., New York. Noon, Aug. 27.
Repair and enlargement of sea wall near southern boundary of Sandy Hook reservation, N. J.—U. S. Engr. Office, Army Bldg., 39 Whitehall St.

N. Y., New York. Noon, Aug. 29.
Dredging in Newtown Creek, N. Y.—U. S. Engr. Office, Army Bldg., 39 Whitehall St.

N. Y., Buffalo. 11 a. m., Aug. 29.
Dredging in outer harbor here.—U. S. Engr. Office, 540 Federal Bldg.

N. Y., Ogdensburg. 11 a. m., Aug. 11.
Dredging in harbor here.—U. S. Engr. Office, 540 Federal Bldg., Buffalo.

Pa., Philadelphia. noon, Aug. 19.
Repairing dike in Delaware River at Artificial Island.—U. S. Engr. Office.

Tenn., Memphis. Aug. 14.
Furnishing 40,000 tons rip rap.—Mississippi River Comm., Custom House.

STREETS AND ROADS.

Ala., Birmingham—City Council passes ordinance to improve Tenth Ave. at cost of \$54,400; also Pike Rd., at cost of \$10,100.

Ala., Birmingham—City Commission passes ordinance to spend \$54,400 to improve 10th Ave. by paving, curbing and guttering.

Ark., Lake Village—Comrs. of Chicot-Ashley Rd. Impvt. Dist. No. 2 have approved plans for construction of road 20 mi. in length, from Lake Billage along M. R. H. & W. Railroad to about nine mi. into Ashley Co. Estimated cost, \$420,000.

Cal., Martinez—The \$2,600,000 bond election to construct 73 miles of highway will take place in this county.

Cal., San Francisco—Bd. of Pub. Wks. posted notice of intention to pave and install concrete curbing on Twenty-seventh to Thirty-third Aves.

Cal., Yuba City (Sutter Co.)—Voters of Sutter County will on August 28 be given opportunity to affirm bond issue of \$810,000 proposed by supervisors for system of good roads extending throughout all parts of county. Fourteen stretches of highway are proposed under bond issue, while seven other stretches would be built with money raised by direct taxation.

Col., Denver—J. E. Maloney, State Hwy. Engr., has prepared program of road building for city of Denver to cost approximately \$4,600,000. Improvements on Colorado Springs-Canon City Rd., to cost \$200,000, and \$90,000 will be spent on that part of road lying in El Paso Co.

Col., Denver—Plans are being made for construction of six-mi. strip of road to Devil's Head Lookout Station from Sedalia-Decker Rd.

Conn., Shelton—Pavements, \$90,000. Engineer V. H. Clark, Ansonia, Conn., drawing plans.

D. C., Washington—Representatives of State Hwy. Depts. of Kansas, Nebraska, Texas, Iowa and Oklahoma forwarded to Congress a memorial asking that \$400,000,000 additional Federal aid for state roads be appropriated immediately, allowing \$100,000,000 each year for four years, beginning in 1920. Congress was asked further to designate that the states, under such appropriation, may have until July, 1925, to use Federal funds before it reverts back to Government.

Fla., Haines City—Bids will be received about Sept. 1 by V. C. Thompson, Comr. of Pub. Wks., for 40,000 sq. yds. of paving, 41,640 ft. of curbing and for sidewalks. McElroy Engineering Co., Engrs., Tampa, Fla.

Fla., Jacksonville—Election was held Aug. 5 upon issuance of \$500,000 of municipal bonds for paving streets, constructing viaduct and other purposes. The Mayor.

Fla., Lakeland—W. L. Slayton & Co., of Toledo, recently purchased issue of street improvement bonds to amount \$375,000.

Fla., Stuart—Election will be held upon issuance of \$120,000 of bonds by district No. 4 for constructing roads.

Ga., Camilla—Garrett & Slack, Montgomery, Ala., engaged as engineers for road construction by Mitchell county commissioners; \$400,000 road bonds recently voted.

Ga., Monroe—Issuance of \$35,000 of municipal paving bonds voted. The Mayor.

Ga., Rome—\$50,000 Government funds have been appropriated since July 1 by Federal Government to Floyd County. It is intention of county commissioners to use this on the Summerville Rd., the fund, matched by like amount from county treasury, to be used for surface for the road.

Ga., Winder—\$100,000 bonds for building roads and \$100,000 bonds for erecting court house was voted. Chmn., Bd. of Co. Comrs.

Ida., Boise City—Ada Co. will vote Aug. 30 on road bond issue of \$1,000,000.

Ida., Moscow—Princeton-Harvard Hwy. Dist. held election June 28 which resulted in favor of issuing highway bonds to amount of \$110,000.

Ida., Preston—City Council has asked for election to vote on bond issue of \$92,000 for improvements, of which \$25,000 is for paving street intersections and \$15,000 for shale roadway. Co.

Comrs. are also planning program for road work.

Ill., Bloomington—Bids will soon be advertised for construction of 4,200-ft. extension to present 9,000 ft. of State-aid Rd. which is being constructed on Towanda Ave. The proposed extension will cost \$24,754.

Ill., Joliet—Co. Court has authorized improvement of Ruby St., also Broadway St., at total cost of \$94,977 and \$121,511, respectively.

Ill., Peoria—City passed ordinance providing for improvement of First and Louck's Aves.

Ill., Vance—The Harris Trust & Savings Bank of Chicago was successful bidder for 5 per cent. road bonds to amount of \$35,000.

Ind., Evansville—City intends taking land for purpose of widening and extending Garvin Park, also to improve Sycamore St.

Ind., Indianapolis—State board of tax commissioners approved 7 bond issue petitions. The 7 petitions approved were: Vigo County—Lost Grove Twp. school, \$37,000. Grant County—Fairmount Twp., Wilson Rd., \$16,700; Center Twp., Kelly Rd., \$7,000; Washington Twp., Hillsamer Rd., \$12,500. Shelby County—Washington Twp., Clark Rd., \$14,418. Wabash County—Lagro and Waltz Twp., Templin Rd., \$18,000. The board granted, effective Sept. 15, petition of Shelby county, Hendricks Twp., for \$10,400 issue for the Emerick Rd.

Ind., Indianapolis—Resolution for grading of 49th St. was adopted. A declaratory resolution was adopted for opening of College Ave., from 46th St. to 51st St. Plans were ordered prepared for following improvements: Permanent improvement of Bradley St. to Pennsylvania railroad tracks; permanent improvement of Dexter St., from 18th to 22d St., and local drain sewer east of Emerson Ave.

Ind., Mount Vernon—Road bonds to amount of \$39,500 were awarded.

Ia., Davenport—Bd. of Supvrs. approved resolutions drawn by Engrg. Dept. providing for paving next year of 20 mi. of county highway. The resolutions also made provision for grading of about 35 mi. of county roads this year.

Ia., Iowa City—River-to-River Rd. is to be paved in Iowa City paving terminus and city limits at cost of \$37,000.

Ia., Sioux City—Election held July 7 resulted in favor of issuing road bonds to amount \$2,000,000.

Ia., Waterloo—Waterloo's construction program for year was materially enlarged by city council. Approximately 4 miles of pavement is outlined. About 2 miles of new sewers are proposed.

Ky., Brooksville (Bracken Co.)—An issue of \$40,000 4½ per cent. road bonds was awarded Wm. R. Compton Co., Cincinnati.

Ky., Marion—Crittenden Co. has authorized \$200,000 road bonds.

La., Clinton—East Feliciana contemplates improvement of about 70 mi. of highways.

La., Lafayette—Election will be held Sept. 11 to vote on issuance of bonds amounting to \$350,000 for improvement of streets.

La., Oberlin—A. E. Darbonne, secretary of Police Jury of Allen Parish, will receive sealed bids until Aug. 26 for \$425,000 5 per cent. semi-annual 25-year road bonds.

La., Thibodaux—Charles J. Coulon, Clk. of Police Jury of La Fourche Parish, will receive sealed bids until Aug. 27 for \$145,000 5 per cent. semi-annual road bonds. Certified check for 2½ per cent. required.

Mass., Great Barrington—It is planned to expend about \$15,000 for concrete paving on Main St. Address Town Clk.

Mass., Marlborough—The city has sold to Arthur Perry & Co. \$30,000 4½ per cent. macadam pavement bonds dated Aug. 1, 1919.

Mass., Salem—City has received bids Aug. 5 for \$150,000 of 4½ per cent. one to ten-yr. paving bonds, and for \$27,500 of 4½ per cent. one to five-yr. bonds to be used for same purpose.

Minn., Coalmont—W. A. Patton, Secy. of Hwys. Comn. of Grundy Co., will receive sealed bids until Aug. 14 for \$200,000 net exceeding 6 per cent. semi-annual road bonds. Certified check for \$1,000 required.

Miss., Purvis—Bd. of Supvrs. of Lamar Co. contemplates issuing \$300,000 road construction bonds. The Chmn.

Mo., Chillicothe—An election will be held Aug. 18 to vote on issuing road bonds to amount \$1,200,000.

Mo., Kansas City—Railroads to pass through Wyandotte Co. will comply with new law providing to plank or pave all

crossings in county roads. This will mean expenditure of \$500,000.

Mo., St. Joseph—City Council passed following ordinances: For paving Frederick Ave., 17th to 26th St.; 8th to 17th St. For paving with concrete Charles St., 29th to 30th. For paving with brick blocks Alabama St. For paving with asphaltic concrete Seneca St., 14th to 15th. For paving with asphaltic concrete a portion of 28th St. For paving with brick blocks 2d St.

Minn., Duluth—City Council passes resolution to improve three streets at cost of \$73,144.

Neb., Beatrice—Five new paving districts recently created by City Comrs. in residence portion have gone through without protest.

Neb., Omaha—City Commissioners will vote \$2,000,000 bonds for widening streets.

Neb., Omaha—Bd. of Co. Comrs. passed resolution ordering advertisements offering \$1,000,000 of the \$3,000,000 highway paving bonds for sale. Bonds were voted June 24 and are to be used to pave 115 mi. of Douglas county roads.

Nev., Reno—Street Committee contemplates construction roads here, to cost \$287,300.

N. J., Elizabeth—Through Compt. Collins Elizabeth has concluded negotiations with city banking institutions for financing street and sewer improvements aggregating \$500,000.

N. J., Knoxville—City Comn. has passed ordinances authorizing sale of street paving, sewer and bridge bonds to amount of \$338,890, and the Comn. also voted to pave portion of East Jackson Ave. and improve a number of other streets.

N. Y., Yonkers—Bd. of Contract and Supply received communication from Common Council regarding the paving of McLean Ave. Petitions from various property owners along the avenue were also received. Pub. Wks. Comr. See and City Engr. Griffith thought that street should be permanently paved from Central to Harrison Ave., where sewer has been installed, but only temporary pavement should be placed on stretch from Central to Caryl Ave. Before work can be done it will be necessary to confer with Yonkers Railroad relative to re-laying of trolley tracks.

N. C., Beaufort—Bill passed Legislature authorizing road bonds by Carteret County to amount \$500,000.

N. C., Dobson—E. M. Linville, Chmn. of Comrs. of Surry Co., will receive sealed bids until Aug. 19 for \$500,000 5 per cent. semi-annual 30-yr. road bonds. Certified check for \$3,000 required.

N. C., Edenton—Last Legislature authorized road bonds to amount of \$300,000.

N. C., Yanceyville—Issuance of road bonds by Caswell County to amount of \$200,000 was authorized by last Legislature.

O., Ashland—The following paving is authorized: King Rd., Banning Ave., Ferrell Ave., W. Walnut St., E. Liberty St., W. 4th and 7th Sts.

O., Columbus—The following improvement will be made here: Paving of Kenso Rd., between High St. and Indianola, at cost of \$40,000.

O., Findlay—Paving with brick, Lima-Sandusky highway, between Findlay and Fostoria. Contractor, Dorsey Construction Co., Findlay, at \$237,000.

O., Lima—City will vote Aug. 12 on bonds of \$106,500 and \$183,000 for sidewalks and paving and the building of a retaining wall.

O., London—4 miles of Bailey joint road in Madison and Franklin Counties, 2 miles water bound macadam and 2 miles dry crushed stone, to W. C. Jewett, Plain City, at \$29,027.

Ore., Coquille—At county court the members authorized county road master to prepare plans and specifications for road from main county road to the Oregon Export Mill, which will be built soon.

Ore., Portland—City council authorized \$210,000 worth of street improvements. Council refused to accept bid of Warren Construction Co. for improvement of E. 61st St. The bitulithic company which submitted the lowest, and incidentally the only bid on improvement, wanted \$886.30 in excess of engineer's estimate of \$10,382. Bids will be readvertised.

Pa., Ephensburg—Sealed bids have been asked on bond sale of \$32,500 for road improvements.

Pa., Pittsburgh—City will ask bids soon on bond issues amounting to \$1,296,000 for street improvements.



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80 West Center Street, Canastota, N. Y.

Pa., Scranton—Improvements that will cost taxpayers about \$800,000 will be made by city next year. Council passed ordinance for paving of West Market St., distance of a mile and a quarter, and the paving and grading job will cost \$63,000 it is estimated by City Engr. West Market St. is to be widened in several places and it may be that Council will decide to put in sewer next year while thoroughfare is being paved. Another big paving job will be done on West Linden St. The cost of paving this thoroughfare is estimated at \$20,000, and street is also to be widened.

Pa., York—Date of election to vote for York county road bonds to amount of \$2,500,000 is Aug. 19.

S. C., Batesburg—Issuance of \$30,000 municipal paving bonds was voted. The Mayor.

Tenn., Chattanooga—Co. Hwy. Comn. has decided to improve roads on four new state highways created in Hamilton Co. \$50,000 will be spent to repair and oil roads.

Tenn., Smithville—Issue of \$125,000 road bonds voted in DeKalb Co. Address Co. Judge.

Tenn., Winchester—Franklin Co. will vote, Sept. 10, on \$750,000 road bonds.

Tex., Anahuac—An election July 5 authorized Commissioners District No. 2 road bonds to amount \$100,000.

Tex., Austin—Bexar, Blanco, Llano and various other counties support proposition to have State Hwy. Comn. designate state highway, to be known as Oil Belt Hwy., extending from San Antonio to the oil fields in Eastland Co. and thence to Wichita Falls.

Tex., Corpus Christi—Proposal to issue \$2,000,000 for construction of approximately 140 miles of hard-surfaced highways in Nueces County carried overwhelmingly. County has been assured approximately \$20,000 in state and federal aid to supplement proceeds of the bonds.

Tex., Dalhart—Engrs. have completed survey and levels of principal streets preparatory to commencing paving construction on several miles of Dalhart streets.

Tex., Dallas—A thoroughfare which will afford direct connection between Oak Cliff and East and South Dallas is the idea of St. Comr. Hal Moseley as aid on relieving traffic congestion in downtown district. The paving of So. Lamar St., from Commerce to Wall St., will give paved connection between downtown streets.

Tex., Denison—While City Comrs. of Denison are having about 15 blocks paved they order other new work done. At their last meeting a bond election was discussed which is soon to be ordered that will mean Denison will have adequate fire alarm system, additions to public schools, new electric lighting system in the business district and more permanent paved streets.

Tex., Dallas—Comrs.' Court voted finally to accept bid of Dallas Trust and Savings Bank for the first \$2,100,000 of \$6,500,000 road bonds.

Tex., Dalhart—Engrs. have been employed by Dallam Co. to make plans for concrete highway from Dalhart to Texline. Levels are now being run and specifications drawn for bridges and complete estimate of the cost will be in the hands of the Comrs. within a few weeks.

Tex., Fort Worth—Bond issue of \$3,450,000 for roads is carried.

Tex., Fort Worth—Atty.-Gen. approved and Comptroller registered bond issues for city of Fort Worth aggregating \$1,890,000, all being serials bearing 5 per cent and divided as follows: Street improvement funding, \$90,000; light extension and improvement, \$50,000; sewage disposal, \$725,000; waterworks funding, \$400,000; sanitary sewer, \$325,000; storm sewer, \$100,000, and general funding, \$200,000.

Tex., Gatesville (Coryell Co.)—Comrs. of this county entered order for bond election in Copperas Cove Rd. Dist. to vote \$100,000 road bonds.

Tex., Hillsboro—Hill Co. Comrs. sold the bonds recently voted seven districts in this county to build good roads, the aggregate being \$1,191,000. Bonds were purchased at par and accrued interest and were from the following districts: Hubbard, \$300,000; Abbott, \$250,000; Mount Calm, \$175,000; Irene, \$100,000; Bynum, \$100,000; Osceola, \$50,000; Penelope, \$216,000. Bonds previously issued and sold by this county are Hillsboro, \$810,000, and Itasca, \$350,000, which gives a grand total road bonds sold by this county of \$2,351,000, with \$50,000 bonds of Covington district yet to be sold.

Engrs. are on the ground doing preliminary work for road construction.

Tex., Houston—Not until all details are arranged for carrying out without interruption the entire road-building program will bids be advertised for beginning the first highways of the system. The Comrs.' Court has committed itself to a policy of caution in spending the road bond money, the first \$2,100,000 of which will be available as soon as bonds come from the printers, or about Aug. 15.

Tex., Mount Pleasant (Titus Co.)—The First National Bank and Messrs. Lewis W. Thomson & Co., of St. Louis, jointly, have been awarded an issue of 5½ per cent. road bonds to amount of \$654,000.

Tex., San Antonio—The largest single item provided for in official call for bond issue is street widening, \$950,000 having been contemplated. Paving new streets and work on those in the residential and business sections where paving has already been done calls for \$900,000, while proposed auditorium and extension of sanitary and storm sewers have been allowed each the sum of \$500,000.

Tex., Sherman—Sherman is experiencing a street paving and general development boom. Bids are ready to be asked for on 13 streets, or about six mi. of additional paving, and the Comn. received petitions for paving of portions of East Lamar and South Cleveland Ave.

Tex., Three Rivers—Special election held for purpose of determining whether or not road bonds in the sum of \$60,000 shall be issued for purpose of building and maintaining paved or graveled roads and turnpikes, and for the levying of a tax in payment therefor.

Tex., Wharton—Reports in Wharton Co. are to effect that election for issuing \$200,000 bonds for building and maintaining public roads has been carried.

Va., Danville—Election, Aug. 5, on \$300,000 street improvement bonds. Address City Clk.

Va., Richmond—Bids have been asked for first block of \$2,500,000 bond issue just authorized by municipal legislative bodies for permanent street improvements in Richmond. The first issue is for \$500,000 and is dated Sept. 1, 1919.

Wash., Centralia—A hearing was held by city commission on resolution for paving D St, 4th St., Tower Ave. and 5th St.

Wash., Chehalis—A petition has been granted Union District by county comrs. to construct concrete pavement leading off Pacific Highway just east of Chehalis, a distance of 4.5 miles.

Wash., Olympia—Following failure to receive satisfactory bid, State Highway Commission has authorized James Allen, highway commissioner, to grade and gravel 7 miles of Olympic Highway west from Olympia, by day labor. Estimate on this work was \$99,996 and Comr. Allen is confident it can be done within the \$100,000 limit.

Wash., Spokane—A paved highway with hard surface may be completed between Spokane and Coeur D'Alene next year as result of resolution passed favoring the plan.

Wash., Waterville—Douglas Co. 5½ per cent. 20-year road bonds to amount of \$375,000, authorized some time ago, have been sold.

W. Va., Charleston—Aug. 12, Kanawha County will vote on bond issues totaling \$1,544,000 for constructing and improving roads.

W. Va., Charleston—City appropriated \$50,000 for purpose of grading and improving streets.

W. Va., Glenville—It is planned to expend about \$26,000 for grading and draining two mi. of road in Gilmer Co. Address Co. Rd. Engr.

W. Va., Marlinton—Resurfacing, etc., planned on about 5.5 mi. of road in Pocahontas Co.; estimate, \$84,000. Address Co. Rd. Engr.

W. Va., Princeton—Grading and paving, \$81,600, Princeton Flat Top road. Engr. E. C. Barton, Fire Station, Bluefield. Lowery Bowling, Clk., Mercer Co. Drawing plans; will call for bids at once. Seven miles macadam concrete or brick.

W. Va., Wheeling—Warwood will hold election to vote on the following bonds which were defeated on July 15: \$119,600 street improvement and 14,000 intersection paving. W. F. Bartele, Town Rec.

W. Va., Winfield—Bids will be received shortly for grading about four mi. of road in Putnam Co.; estimate, \$32,000.

Ont., Bridgeburg—The good roads plans of Welland Co. Council call for expenditure of \$131,756. The roads to be constructed consist of 10 mi. of new roads near Port Colborne, at approxi-

mate cost of \$9,978 per mi.; one-half mi. of concrete roadway through village of Ridgeway, at cost of \$19,500; the Garrison road extension, known as the Bethel road, two and one-half mi., at cost of \$5,544 per mi.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

***Fla., St. Augustine**—Awarding of contract for grading of roadbeds and construction of bridges in Shell Bluff Special Rd. and Bridge Dist. have been let at \$35,518.25, that being the bid submitted by C. A. Smith after deducting \$4,050 for certain work that is to be done on force account by Bd. of Co. Comrs. There were three regular bids submitted, ranging from those of successful bidder up to \$50,000.

***Ind., Indianapolis**—Fulton Co. Comrs. report the awarding of following contracts: Contract for construction of gravel road to David B. Clevenger, Rochester, Ind., at \$26,335; contract for construction of gravel road known as Ailer Rd., to James B. Waddell, Rochester, Ind., at \$34,873; contract for construction of gravel road known as O'Connell road to David B. Clevenger, Rochester, Ind., at \$36,965.

***Kan., Marysville**—Contract for paving virtually all the streets of Marysville, Kan., 70 blocks, with brick has been awarded the Metropolitan Paving Co., of St. Joseph, for a total of \$360,000. This is said to be largest contract of kind awarded in Kansas.

***Ky., Paris**—Burke & Wood, of Louisville, was awarded contract for laying concrete streets in Paris. The award covers entire length of Pleasant St. and Main, from 10th to 14th. Contract price was \$43,000. Work will be started in a few days.

***Minn., Virginia**—Lawrence-McCann, Eveleth, were granted by City Council contract for paving nine blocks on North and South Side with Warrenite at cost of \$42,503. Among thoroughfares that will be improved are 14th and 15th Sts. and Seventh, Eighth and Ninth Aves. on North Side. The western end of 6th St. S. will also be paved. The per sq. yd. paving cost will be \$3.63. The work is to be completed by Oct. 15.

***Neb., Laurel**—Contract for 20,000 yds. of paving, to cost approximately \$82,000, was let by Bd. of Trustees to Western States Construction Co., of Omaha, for \$4.10 a yd. Vitriified brick block will be used, and contract calls for completion of work this year.

N. J., Metuchen—Borough Council received bids for curbing Amboy Ave., from Lake Ave. easterly to borough line. East Jersey Bridge Co., concrete curb, \$1.10 per lin. ft., 3½-in. bluestone curb, \$1.30; 4-in. bluestone, \$1.40. T. H. Riddle, concrete, \$1; 3½-in. bluestone, \$1; 4-in. bluestone, \$1.10. Tyler Blue Stone Co., 3½-in. bluestone, \$1.25; 4-in. bluestone, \$1.35.

***N. Y., Albany**—Board of contract and supply has awarded contract for improvement of Western Ave. from Manning Blvd. to west city line to Patrick W. Mulderry for \$69,898.20. Contract for improvement of Barclay St. and Summit Ave. has been awarded to William F. Campion for \$27,864. Work on both jobs will be started at once. The improvement of Western Ave. will consist of concrete roadway 18 ft. wide.

N. Y., Albany—Proposals for improvement of following highways were received by State Comn. of Hwys the 29th of July, 1919:

Road No. 8008, Brockton-Fredonia, Chautauqua Co., 4.64 mi.; engineer's estimate, \$131,778.50; E. J. Bailey, Brockton, N. Y., \$131,554.50.

Road No. 1397, Gunn Corners-Fishers Ldg., Pt. 2, Jefferson Co., 6.78 mi.; engineer's estimate, \$137,418.85; Henry P. Burgard Co., Buffalo, N. Y., \$127,709.81; McCarthy & Rock, Winthrop, N. Y., \$132,738.85.

And also for completion of following highways:

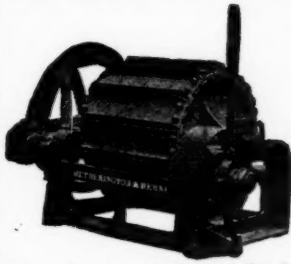
Road No. 5615, Belfast-Caneadea, Allegany Co., 9.07 mi.; engineer's estimate, \$182,055.50; Wm. J. Fox, Oramel, N. Y., \$180,622.30; Frank J. Foote Co., Inc., Nunda, N. Y., \$221,419.51; Jas. A. Hughes, Jamestown, N. Y., \$196,452.

Road No. 5543, Hinsdale-Franklinville, Pt. 1, Cattaraugus Co., 6.98 mi.; engineer's estimate for the work, \$151,293.50; Louis H. Gipp, Buffalo, N. Y., \$137,588; Mosier & Summers, Inc., Buffalo, N. Y., \$151,293.50.

Road No. 5609, Port Byron-Weedsport, Cayuga Co., 3.89 mi.; engineer's estimate, \$29,442.85; Kennedy Contracting Co., Al-

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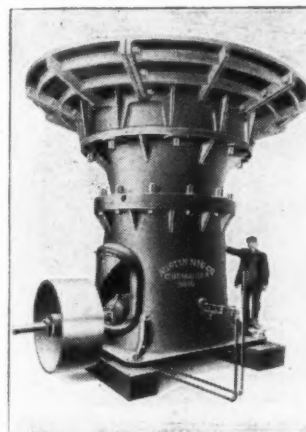
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bany, N. Y., \$28,712; Knox, Shaw & Drake, Auburn, N. Y., \$29,402.85.

Road No. 5610, Montezuma-Port Byron, Cayuga Co., 4.39 mi.; engineer's estimate, \$155,572.80; Scott Bros., Rome, N. Y., \$153,342.80; Morrison & Quinn, Inc., Rochester, N. Y., \$155,268.51.

Road No. 5580, Amenia-Pine Plains, Pt. 1, Dutchess Co., 6.97 mi.; S. B. Van Wageningen, Inc., Rondout, N. Y., \$108,279.65; John DeMichiel & Bros., Torrington, Conn., \$117,878.85.

Road No. 5628, Amenia-Pine Plains, Pt. 2, Dutchess Co., 6.79 mi.; engineer's estimate, \$163,273.10; Samuel Beskin, Beacon, N. Y., \$150,007.60; John A. Jova, Inc., Roseton, N. Y., \$157,396.11.

Road No. 5602, Malone Village, Main and Elms Sts., Franklin Co., 1.99 mi.; engineer's estimate, \$26,685.98; Arthur F. McConville, Ogdensburg, N. Y., \$27,427.58.

Road No. 1255, Cape Vincent-Clayton Jefferson Co., 14.05 mi.; engineer's estimate, \$184,630.38; F. H. Rhody, Albion, N. Y., \$179,686.25; Henry P. Burgard Co., Buffalo, N. Y., \$181,597.59.

Road No. 1256, Gunn Corners-Fishers Ldg., Part 1, Jefferson Co., 7.76 mi.; engineer's estimate, \$123,281.56; Henry P. Burgard Co., Buffalo, N. Y., \$121,575.84.

Road No. 5593A, Caledonia-Mt. Morris, Pt. 1, Livingston Co., 7.69 mi.; engineer's estimate, \$190,802; Frank J. Foote Co., Inc., Nunda, N. Y., \$185,290.71; H. C. Schroeder, Rochester, N. Y., \$189,067.

Road No. 1390, Chili-Coldwater, Monroe Co., 2.92 mi.; engineers' estimate, \$39,477.55; Greenfield Const. Co., Hornell, N. Y., \$35,316.83; Hendrickson - McCabe Const. Co., Inc., Syracuse, N. Y., \$39,210.04.

Road No. 1391, Sweden-Walker, Monroe Co., 7.93 mi.; engineer's estimate, \$173,165; Greenfield Const. Co., Hornell, N. Y., \$164,852.40; A. J. Rockwood, Rochester, N. Y., \$171,852.80.

Road No. 1393A, Scottsville-Rush, Monroe Co., 5.27 mi.; engineer's estimate, \$199,848; R. T. Ford Co., Rochester, N. Y., \$191,956.50; Frank J. Foote Co., Inc., Nunda, N. Y., \$196,099.61.

Road No. 1466, Churchville-Adams Basin, Monroe Co., 6.33 mi.; engineer's estimate, \$74,548.50; Ribstein-Holter Co., Inc., Rochester, N. Y., \$71,785.55; Wing & Munger, Holley, N. Y., \$73,588.50.

Road No. 1499 A, Scottsville-West Henrietta, Monroe Co., 4.56 mi.; engineer's estimate, \$133,566.21; John Petrossi Co., Rochester, N. Y., \$128,060.71; E. W. Foley Cont. Corp., N. Y. City, \$133,260.30.

Road No. 5597, Utica-Poland, Pt. 3, Oneida Co., 5.34 mi.; engineer's estimate, \$156,005; P. H. Murray, Rochester, N. Y., \$169,095; H. A. Schupp, Inc., Albany, \$184,906.

Road No. 1072, Syracuse-Bridgeport, Pt. 2, Onondaga Co., 3.06 mi.; engineer's estimate, \$66,261.65; L. D. Sullivan Co., Inc., Utica, N. Y., \$59,526.25; F. W. Hamilton, Rochester, N. Y., \$65,689.

Road No. 5498, Cornwall-West Point, Pts. 1 and 2, Storm King Hwy., 4.03 mi.; engineer's estimate, \$460,356.35; John L. Hayes Const. Co., Inc., Yonkers, N. Y., \$453,583.85; Rosoff Eng. Co., New York City, \$459,346.35.

Road No. 5557, Townsend-Watkins, Schuyler Co., 6.03 mi.; engineer's estimate, \$94,770; Willis L. Frost, Watkins, N. Y., \$89,244.50.

Road No. 1058A, Wolcott-Savannah, Pt. 3, Wayne Co., 2.25 mi.; engineer's estimate, \$39,714.60; Hendrickson-McCabe Const. Co., Inc., Syracuse, N. Y., \$39,225.98; Floyd H. Wells, Savannah, \$39,193.50.

N. Y., Niagara—State Hwy. Dept. announces from Albany that it has received proposals for contract to construct Part 1 of Youngstown-Lockport state and county highway in Niagara Co., a section 7.78 mi. in length, as follows: Walter C. Rich, Youngstown, N. Y., \$207,311.22; Public Construction Co., Niagara Falls, N. Y., \$213,364.80; F. J. Mumma Contracting Co., Inc., Buffalo, N. Y., \$214,514.80. The Engr's estimate is \$214,514.80.

***O., Akron**—Concrete road, Mogadore to N. Springfield, 2.3 miles, \$40,000, to Lee McCormick, Ravenna.

O., Canal Dover—South site sewer clogged and system is in need of overhauling and enlargement.

***Okla., Tulsa**—Contract was let to Parker-Washington Co. for sum of \$108,926.98 for 20,850 yards of Texaco asphalt. City Engr's estimate was \$109,235.98. The Western Paving Co., only other bidder, was far above the estimate and their bid was held irregular.

Pa., Harrisburg—Following bids were received by State Hwy. Comm. July 29, 1919:

Adams Co., Butler Twp., Rout. No. 41, 23,246 ft. one-course reinforced concrete and hillside vitrified brick—Winston &

Co., 240 Fair St., Kingston, N. Y., \$188,525.14; Mason & Hanger Co., Inc., Chambersburg, Pa., \$192,519.33.

Adams Co., Tyrone and Strabane Twp., Route No. 123, 13,733 ft. one-course reinforced concrete—Winston & Co., 240 Fair St., Kingston, N. Y., \$154,715.91; M. Bennett & Sons, Indiana, Pa., \$135,267.26.

Beaver Co., Eastvale Boro. and North Sewickley Twp., Applications Nos. 122 and 124, 14,481 ft. reinforced concrete—J. H. DeCarpentier & Sons, 521 Falls Ave., Youngstown, O., \$155,355.87; E. W. Faick, Leedsdale, Pa., \$141,510.75; Thos. McNally & Son Co., 701 Oliver Bldg., Pittsburgh, Pa., \$144,678.35; Aronberg & McDonald, 313 Citizens' Bldg., Norfolk, Va., \$138,431.51.

Bradford Co., Athens, Sayre and Co., Waverly Boro., Route No. 287, 15,207 ft. vitrified brick on concrete foundation and bituminous surface course on concrete foundation—Warren Bros. Co., 142 Berkeley St., Boston, Mass. (Class "D"), \$188,060.31.

Chester Co., Franklin and New London Twp., Applications Nos. 557 and 558, 21,619 ft. bituminous macadam surface course (penetration method) on telford foundation—No bids.

Chester Co., East and West Marlboro Twp., Applications Nos. 136 and 419, 10,509 ft. bituminous macadam surface course (penetration method) on telford foundation—No bids.

Chester and Delaware Cos., Tredyffrin, Eastown and Radnor Twp., 46,815 ft. resurfacing, bituminous mixtures on prepared broken stone base—Union Paving Co., 30th and Locust Sts., Philadelphia, Pa. (Class "A"), \$110,483.40; E. H. Johnson Co., Wayne, Pa., Delaware Co. (Class "B"), \$115,164.90; Columbus Asphalt Paving Co., 1101 B. F. Jones Bldg., Pittsburgh, Pa. (Class "B"), \$126,400.50; Eastern Paving Co., 401 Colonial Trust Bldg., Philadelphia, Pa. (Class "A"), \$134,827.20; Cunningham Paving & Const. Co., 1345 Arch St., Philadelphia, Pa. (Class "B"), \$99,247.80.

Crawford Co., East Mead Twp., Route No. 89, 18,640 ft. one-course reinforced concrete and hillside vitrified brick—No bids.

Crawford Co., Vernon Twp., Route Nos. 82, 18, 619, one-course reinforced concrete and hillside vitrified brick or two-course reinforced concrete and hillside vitrified brick—Atlanta Const. Co., Atlanta, N. Y., 313 Citizens Bldg., \$229,064.89; Bronberg & McDonald, 313 Citizens Bldg., Norfolk, Va., \$212,439.88.

Eric Co., Girard Twp., East Springfield Boro., Route No. 86, 20,400 ft. either bituminous surface course on concrete foundation and hillside vitrified brick or one-course reinforced concrete and hillside vitrified brick—The Campbell Bros. Co., 609 Stambaugh Bldg., Youngstown, O. (Class "B"), \$340,975.96; Griff Construction Co., 1117 State St., Erie, Pa., \$192,005.15; Aronberg & McDonald, 313 Citizens Bldg., Norfolk, Va., \$243,722.77.

Eric Co., Mill Creek Twp., Route No. 86, 21,120 ft. either bituminous surface course on concrete foundation or one-course reinforced concrete—Chas. H. Fry Const. Co., Cherry and 19th St., Erie, Pa., \$122,606.76; Griff Const. Co., 1117 State St., Erie, Pa., \$127,634.35; Henry Shenk Co., 12th and Sassafras Sts., Erie, Pa. (Class A), \$144,915.65; The Gaylord Inter. Eng. & Const. Co., Inc., cor. Orchard Ave. and Cedar St., Scranton, Pa. (Class B), \$125,864.93.

Eric Co., Northeast Twp., Route No. 304, 7,900 ft. either bituminous surface course on concrete foundation or one-course reinforced concrete—No bids.

Fayette Co., Menallen Twp., Route No. 112, 19,918 ft. vitrified brick pavement on concrete foundation—Brooke & Cornish, 620 and 622 Fayette Title & Trust Bldg., Uniontown, Pa., \$167,016.15; Aronberg & McDonald, 313 Citizens Bank Bldg., Norfolk, Va., \$171,906.15.

Jefferson Co., Pine Creek Twp., Route No. 60, \$25,972 ft. one-course reinforced concrete and hillside brick—Aronberg & McDonald, 313 Citizens' Bank Bldg., Norfolk, Va., \$237,516.45; Dale Engineering Co., 23 Mann Bldg., Utica, N. Y., \$260,346.80.

Lawrence Co., Union and Mahoning Twp., Route No. 81, 29,628 ft. one-course reinforced concrete and hillside vitrified brick or two-course reinforced concrete and hillside brick—Burns Bros., 323 E. Washington St., New Castle, Pa., \$265,015.45 (this total subject to correction); T. H. Gill Co., Security Mutual Bldg., Binghamton, N. Y., \$263,569.75; Aronberg & McDonald, 313 Citizens Bank Bldg., Norfolk, Va., \$242,816.71.

Mifflin Co., Armaugh Twp., Route No. 29, 24,049 ft. either bituminous surface course on concrete foundation and hillside vitrified brick or one-course rein-

forced concrete and hillside vitrified brick—Mason & Hanger Co., Inc., Chambersburg, Pa., \$253,859.58; Winston & Co., 240 Fair St., Kingston, N. Y., \$258,198.92; Bennett & Randall, Lebanon, Pa., \$271,546.50.

Montgomery Co., East Norriton Twp., Route No. 178, 5,575 ft. either bituminous surface course on concrete foundation or one-course reinforced concrete—Field, Barker & Underwood, Commercial Trust Bldg., Philadelphia, Pa., \$35,100.12; Union Paving Co., 30th and Locust St., Philadelphia, Pa. (Class A), \$36,593.82; Jas. McGraw Co., 1010 Commercial Trust Bldg., Philadelphia, Pa., \$39,479.50; Sutton Contracting Co., Inc., 640 Heed Bldg., Philadelphia, Pa., \$37,540; H. B. Tranger, National Park, N. J., \$35,253.23; Jos. W. H. Gottshalk, Perkiomenville, Pa. (Montgomery Co.), \$43,997.30; Henry E. Batton, 1713 Sansom St., Philadelphia, Pa., \$38,330.65; Wm. C. Evans, Ambler, Pa. (Class B), \$41,193.90.

Montgomery Co. and Bucks Co., Montgomery and New Britain Twp., Route No. 178, 15,898 ft. either bituminous surface course on concrete foundation or one-course reinforced concrete—Henry E. Batton, 1713 Sansom St., Philadelphia, Pa., \$126,333.72; Union Paving Co., 30th and Locust St., Philadelphia, Pa. (Class A), \$150,189.57; Manwaring & Cummins, Inc., 5600 Germantown Ave., Philadelphia, Pa., \$140,767.80; Arthur McMullen Co., 1309 and 10 Finance Bldg., Philadelphia, Pa., \$142,677.15; Wm. C. Evans, Ambler, Pa. (Class B), \$150,380.10; James McGraw Co., 1010 Commercial Trust Bldg., Philadelphia, Pa., \$132,706.92.

Montgomery Co., Springfield, White Marsh, Upper Dublin and Lower Gwynedd Twp., Route No. 153, 37,723 ft. either bituminous surface course on concrete foundation and hillside vitrified brick or one-course reinforced concrete and hillside vitrified brick—Manwaring & Cummins, Inc., 5600 Germantown Ave., Philadelphia, Pa., \$242,302.40; Wm. C. Evans, Ambler, Pa. (Class B), \$276,144.95; Union Paving Co., 30th and Locust Sts., Philadelphia, Pa. (Class A), \$243,905.39; Jas. McGraw Co., 1010 Commercial Trust Bldg., Philadelphia, Pa., \$242,819.52; Arthur McMullen Co., 1309-10 Finance Bldg., Philadelphia, Pa., \$271,817.20; MacArthur Bros. Co., 120 Broadway, New York City, N. Y., \$292,764.05.

Northampton Co., Bethlehem and Lower Nazareth Twp., Route No. 297, 2565 ft. resurfacing, bituminous mixtures on a prepared broken stone base—R. S. Rathbun Contracting Co., 409 Vine St., Bethlehem, Pa. (Class E), \$70,239.40; Frank J. Groman & Sons, Bethlehem, Pa. (Class E), \$67,958.90; Eastern Paving Co., 401 Colonial Trust Bldg., Philadelphia, Pa. (Class A), \$67,502.80.

Susquehanna Co., Hopbottom Boro., Lathrop, Lenox, Harford and New Milford Twp., Route No. 9, 53,896 ft. either bituminous surface course on concrete foundation or one-course reinforced concrete—The Gaylord International Engineering and Constr. Co., Cedar St. and Orchard Ave., Scranton, Pa. (Class B), \$342,637.46; The R. T. & C. D. Stewart Constructing Co., 14 S. 3d St., Easton, Pa., \$371,653.58; Winston & Co., 240 Fair St., Kingston, N. Y., \$353,255.20; MacArthur Bros. Co., 120 Broadway, New York City, N. Y., \$363,712.10.

Union Co., Lewis Twp., Route No. 27, 11,484 ft. one-course reinforced concrete—T. L. Evans Sons, 344 Terry St., Danville, Pa., \$67,366.82; Sutton Contracting Co., Inc., 640 Heed Bldg., Philadelphia, Pa., \$75,845.20; Wertley & Housey, Pottsville, Pa., \$77,123.30; Richardson Hand, Wilkes-Barre, Pa., \$74,099.20.

Washington Co., Canonsburg Boro., Route No. 108, 1,106 ft. vitrified brick—R. W. Wilson, South Central Ave., Canonsburg, Pa., \$34,787.66 (total will be changed); Harry & Rankin, 40 Murdock St., Canonsburg, Pa., \$18,416.

Washington Co., East Bethlehem Twp., Route No. 248, 2,480 ft. one-course reinforced and hillside vitrified brick—Brooke & Cornish, 620-22 Fayette Title & Trust Bldg., Uniontown, Pa., \$79,191; Thos. Arrigo, Charleroi, Pa., \$95,048.70; R. D. Thomas & Co., 6 Boundary St., Pittsburgh, Pa., \$90,206.20; Donora Construction Co., Inc., Donora, Pa., \$88,297.10; Geo. S. White Co., 7119 Jenkins Arcade Bldg., Pittsburgh, Pa., \$83,571.20.

Westmoreland Co., Hempfield Twp., Route No. 117, 12,055 ft. one-course reinforced concrete and hillside vitrified brick, Aronberg & McDonald, 313 Citizens Bldg., Norfolk, Va., \$110,979.75; Geo. S. White Co., 7117 Jenkins Arcade Bldg., Pittsburgh, Pa., \$119,460.65; Dawson Construction Co., Inc., Connellsville, Pa., \$107,855.70.

Westmoreland Co., North Huntingdon Twp., Application No. 527, 7,484 ft. one-



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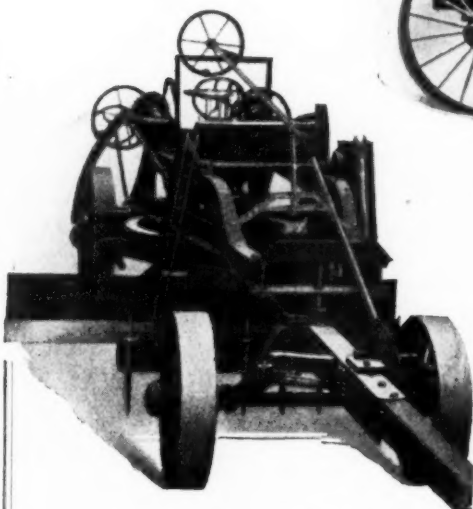
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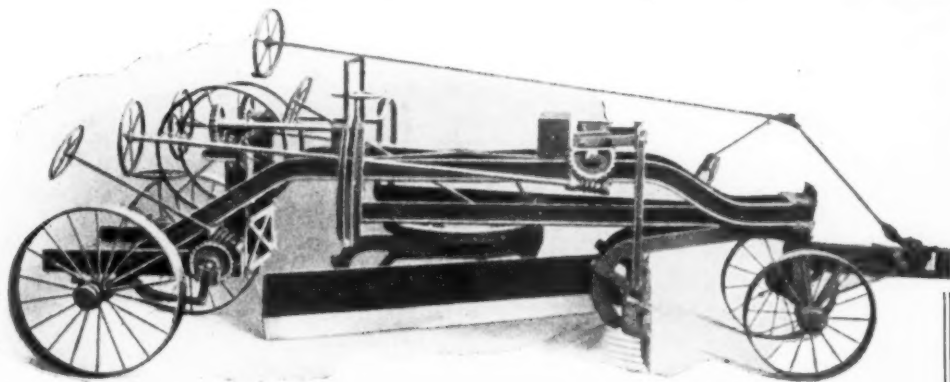
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course reinforced concrete—Thos. L. Ryan, Ligonier, Pa., \$114,960.66; Geo. S. White Co., 7117 Jenkins Arcade Bldg., Pittsburgh, Pa., \$137,965.45; T. H. Gill Co., Security Mutual Bldg., Binghamton, N. Y., \$121,873.08; M. O'Herron Co., First and McKean Sts., S. S., Pittsburgh, Pa., \$112,834.51; R. H. Cunningham & Sons Co., 600 Penn. Ave., Turtle Creek, Pa. (Allegheny Co.), \$128,893.05; Hillside Stone Co., Farmers' Bank Bldg., Pittsburgh, Pa., \$111,966.20.

Wyoming Co., "Lackawanna Trail," Nicholson Twp. and Nicholson Boro., Route No. 9, Station 856; bridge to be triple-span highway bridge having reinforced concrete floor system; also additions and repairs to the present piers and abutments—Anthracite Bridge Co., 310 Genet St., Scranton, Pa., \$56,538.35; G. W. Ensign, Inc., Hershey Bldg., Harrisburg, Pa., \$100,036.10; Whittaker & Diehl, Harrisburg, Pa., \$70,744.40; Walter S. Rae, 439 Oliver Bldg., Pittsburgh, Pa., \$64,066.90.

York Co., York Twp., Route No. 127, Station 205; bridge to be one through-truss highway bridge having a reinforced concrete floor system; also additions and repairs to present abutments—G. A. & F. M. Wagman, Dallastown, Pa. (York Co.), \$28,938; Wm. H. Goll, trading as John Goll & Co., 1539 Filbert St., Philadelphia, Pa., \$43,945; G. W. Ensign, Inc., Harrisburg, Pa., \$35,205.50; Whittaker & Diehl, Harrisburg, Pa., \$43,023.

*Pa., Meyersdale—B. J. Lynch was awarded contract for constructing State road from Salisbury to State line, 10,554 ft., for \$92,904.72.

*Pa., Pittsburgh—Co. Comrs. let contract to McCready Bros. Co. for \$31,066 for paving between street car tracks of the Glass Run Rd. and West Run Rd., a distance of 2,700 ft. Contract for improvement of the Meridian and Gibsonia Rds., a distance of 15,000 ft., was let to McLaughlin Bros. Contracting Co. The work of the paving, which will be of reinforced concrete, will be 16 ft.

*Tex., Corpus Christi—Proposal to issue \$2,000,000 bonds for construction of modern highway system in Nueces Co. was overwhelmingly indorsed by Co.; 40 mi. of hard-surfaced highways, serving every portion of the Co., is provided for. In addition Co. has been assured \$200,000 in State and Federal aid.

*Tex., Fort Worth—See "Streets and Roads."

*Tex., San Antonio—See "Streets and Roads."

*Tex., Vernon—H. K. McCollum, of Ft. Worth, was awarded contract for construction of approximately 50,000 sq. yds. of pavement in Vernon. Specifications call for one-course of six-inch concrete.

*Wash., Aberdeen—Contract for paving from Elma to Satsop was awarded Aberdeen Paving Co., on bid \$118,690. A stretch of 3 miles from Hoquiam northwest on North Beach Rd. was awarded Grays Harbor Construction Co., of Hoquiam.

*Wash., Colville—Bids were opened for paving and parking five blocks in the business center, including three blocks on Main St. The bids were based upon both cash and bond basis, all being Spokane contractors. The following bids were presented: Alloway & George, cash, \$23,668; bonds, \$24,497; Root & Joslin, cash, \$24,145; bonds, \$25,021; J. W. Baylor, bonds, \$26,764; C. M. Payne, bonds, \$25,182; J. C. Broad, bonds, \$25,265. At conclusion of opening bids it was found that ordinance creating improvement district and authorizing work to be done had not been published. All bids were therefore held in abeyance subject to return to respective bidders for revision and resubmission according to their option.

*Wash., Olympia—Under urging of Whatcom Co. Comrs., State Hwy. Comn. has reconsidered its rejection of lowest bid on three mi. of paving on Pacific Hwy. from Bellingham south and has let the contract to J. W. Hoover, of Everett, on bid of \$106,074.

*Wash., Seattle—Figures received by Bd. of King Co. Comrs. July 14 for grading and graveling of Bellevue-Newport Rd., 3½ mi. in length and including construction of a 2,500-ft. trestle roadway have been checked and contract awarded Hanson & Hauge. Cost of the work will be far in excess of estimate of Co. Engr. Sam Humes. Bids received follows: Hanson & Hauge, \$76,800; J. W. Hoover & Co., \$89,047; Hans Pederson, \$89,250; Robt. A. Sloane, \$96,000.

*Wash., Vancouver—Contract for paving 22d St., from Main to Reserve, was awarded by City Council recently to Warren Construction Co., of Portland, on its bid of \$29,660.

*Ont., Welland—Tenders let for work

as follows: Ten mi. on Forks Rd., running through Marshville to Port Colborne, waterbound macadam, to John Pirson, at \$9,978.20 per mi.; half-mi. concrete roadway in Ridgeway let to E. B. Begy, at \$19,500; 2½ mi. on Bethel Rd., Rd. Div. 16, let to John Pirson.

SEWERAGE AND SANITATION

Ala., Roanoke—Election will be held upon issuance of \$25,000 municipal bonds for extending sewer system and improving waterworks. The Mayor.

Cal., Benicia (Solano Co.)—All bids for construction of West Side sewer have been rejected by City Trustees and Clk. authorized to advertise for new bids.

Ga., Jesup—Election will be held Aug. 23 upon issuance of \$30,000 municipal bonds for constructing sewers. S. E. Cohen, Mayor.

Ill., St. Charles—City contemplates laying of sewers in Highland addition in 2d Ward.

Ia., Waterloo—City council passes resolution to construct sewers in 11 streets.

Mass., Pittsfield—City contemplates expending \$36,000 for sewer improvements and \$41,000 for water improvements.

Mich., Detroit—Dept. of Pub. Works has petitioned city council for \$1,325,000 for construction of sewers in Woodward Ave. district.

Mich., Lansing—Bond issue of \$184,000 for sewers has been approved.

Minn., Duluth—City Council passes resolution to construct seven sewers.

Minn., Madelia—Storm sewers, \$80,000. Engr., Bradley Engrg. Co., St. Cloud, Minn. W. W. Cole, City Clk. Bonds voted.

Mont., Billings—Election soon to vote \$400,000 storm sewer bonds. E. N. Sackett, City Clk.

Neb., Harvard—Survey for sewer system has been completed and town board plans early action. Address chairman of board.

Neb., Ord—Election soon to vote \$40,000 sewer system bonds.

Neb., Tilden—Sewer. Mech. Engr. W. E. Standeven, 414 Peters Trust Bldg., Omaha, drawing plans.

Neb., Wilber—A \$44,000 sewer system is planned for this town. Address mayor.

N. J., Clifton—Citizens are planning to have sewer system installed. Public meeting was recently held to discuss the subject.

N. J., Glen Ridge—Boro. Council authorized issuance of bonds to amount of \$142,000 for improvement of sewer in Passaic Valley.

N. J., Hackensack—Council has adopted ordinance for construction of new sewer system to cost about \$400,000. Address Comr. Meneely.

N. J., Knoxville—See "Streets and Roads."

N. J., Paulsboro—Sanitary sewers and sewage disposal plant, \$100,000. Engrs., Remington & Vosbury, N. E. cor. 6th and Market Sts., Camden. Jos. M. Paul, Chm. Boro. Council, Paulsboro. Plans drawn. Will take bids soon.

N. J., Trenton—Sewers, various streets. Engr., H. C. Gregory, City Hall. L. D. Hirsch, Clk., City Hall. Contemplated. T. c. pipe.

N. J., Ventnor—Issuance of bonds to amount of \$100,000 was authorized in ordinance for extension of waterworks. It will include building of a new reservoir.

N. J., Woodbridge—Appropriation of \$35,000 has been made for sewer extension. John E. Breckenridge, Chm. of Twp. Committee.

N. Y., Brooklyn—Bd. of Estimate has appropriated \$400,000 for repair of Greene Ave. storm sewer which is said to be in danger of failure.

N. Y., Corning—Campaign is under way for issuing \$30,000 bonds for sewer extensions. George W. Lane, Mayor.

N. C., Enfield—Water and sewer bonds to amount of \$85,000 which are to be submitted to vote of the people were authorized by last Legislature.

O., Bellaire—Following sewer work has been authorized: Indian Run, \$17,000.

O., Canton—City Mayor has informed Council that city needs 16 more storm sewers.

O., Columbus—Sewer to be built in Twelfth Ave. at cost of \$30,000; also a relief sewer in Third Ave.

O., Dayton—Sanitary sewers; \$100,000 Mt. Auburn Dist. Engrs., Cellarius & Dresler, 1001 Commerical Bldg., Dayton. A. Aszling, Clk., Montgomery County.

Court House, Dayton. Take bids shortly. 43,170 lin. ft. 8-in. vit. pipe, 6,000 lin. ft. 11-in. vit. pipe, 144 manholes, 1,710 lin. ft. trenching, 28 flush tanks, 100 lin. ft. lead pipe, 12,000 ft. 5-in. drain tile, 30,000 b. m. oak sheathing, 150 sq. yd. repaving.

O., Hudson—Bond issues aggregating \$12,700 for sewer extension have been offered for sale. B. S. Sanford, village clerk.

O., Huron—Geo. B. Gascoigne of Cleveland has submitted plans for sewage plant for Mitewanga and Ruggles Beach to County Commissioners.

O., Lima—Relief trunk sewers, \$1,000,000. Various streets. Engr., C. V. Miller, City Hall, Lima. Consltg. Engrs., Fuller & McClintock, 170 Broadway, N. Y. C., and 213 Masonic Bldg., Lima. A. L. Matheny, Dir. of Pub. Service, City Hall, Lima. Contract No. 1, \$590,000. Will be ready later.

O., Louisville—An election will be held Aug. 16 to vote sewer bonds to amount \$15,000.

O., Toledo—Legislation for \$1,000,000 bond issue for Ten Mile Creek intercepting sewer was approved. This issue will be the first sold of the \$2,800,000 voted by the people for complete sewage intercepting plan.

O., West Park—Sewer, \$34,600. Engr., Henry Beitz, Town Hall. J. J. Hayes, Clk., Town Hall. Will advertise for bids at once; 1,000 lin. ft. 35-in. segment blk., 800 lin. ft. 27 to 30 in. double strength pipe, 1,090 lin. ft. double strength vit. pipe, 8,092 ft. 12 to 18 in. single straight pipe.

Okl., Oklahoma City—Sewers. Engr., B. M. Hart, City Hall. C. F. Semelbeck, City Clk. Second resolution passed. Will advertise for bids soon.

Pa., Allentown—Plans are being completed for sanitary house sewerage system which will cost \$500,000.

Pa., Easton—Sewage disposal system. Engrs., Harrison, Mertz & Emlen, Com. Trust Bldg., Philadelphia. Owner, Easton Hospital Assoc., Mrs. Mary Illick, Pres., 248 Spring Garden St., Easton. Drawing plans.

Pa., Erie—Sewer project involving about \$357,000 has been approved by Council.

Pa., Philadelphia—Sewers are to be built in Know St. to run to Charles through Longshot, Gilmore and Tysons Sts. Approximate cost, \$65,000.

Pa., Scranton—Several sanitary sewers are to be constructed in the spring. One will be in Sec. A of 21st Ward. Another sewer is to be built in the 22d Ward and another in Sec. L of the 17th Ward.

Pa., Wesleyville—Sewerage system and sewage disposal plant, \$70,000. Consltg. Engr., B. E. Briggs, 208 Marine Bank Bldg., Erie. A. Thomason, Secy., Wesleyville.

S. D., Gregory—Carried at election \$122,000 sewerage and municipal electric light and power system bonds.

S. D., Menlo—Election, Aug. 1, to vote \$35,000 municipal sewerage system bonds.

S. D., Iroquois—As special election the voters by big majorities authorized issuance of bonds of \$35,000 for installing sewerage system, and \$20,000 with which to extend and improve the municipal waterworks system.

Tex., Bryan—City Comn. is having survey made of city with view to extending present sewer system. Prof. J. C. Nagle has been appointed consulting engineer and work is being done under his direction.

Tex., Cleburne—Mayor Short said that extension of paved district of the city would call for system of storm sewers, and that while it would take \$250,000 to complete this system, yet for economy's sake the main sewers could be put in and provision made for laterals later.

Wash., Yakima—Special election to be held soon on bond issue of \$344,300 for sewer construction.

W. Va., Charleston—City will appropriate \$300,000 for construction of sewers for proper drainage.

W. Va., Wheeling—Town of Warwood intends to hold election to vote on bonds of \$17,000 for sewer.

Wyo., Cheyenne—J. J. Showalter, City Clk., informs that special election was carried in favor of issuing \$300,000 storm and sanitary sewer bonds.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Minn., Hinckley—O'Neil & Preston, of St. Paul, awarded contract for construction of general sewer and waterworks at \$50,000.

Minn., St. Cloud—Gedney & Murphy, Minneapolis, Minn., awarded contract

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"Nature's Own Paving"

Is the most economical hard surface material—requires no plant—only unskilled labor—hand tools and road roller needed.

Kentucky Rock Asphalt is waterproof, dustless, does not wash away or "throw off" under auto or steel tire traffic.

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Resurfacing Asphalt for new surfaces—refined directly
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(New Jersey)

GEORGE W. LAMSON
Western Representative
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ASPHALT DEPARTMENT

OFFICIAL ADVERTISING

Pennsylvania State Highway Department, Harrisburg, Pa.—Sealed proposals will be received at the State Capitol until 10:00 A. M., August 18, 1919, when bids will be publicly opened and scheduled and contracts awarded as soon thereafter as possible for the construction of the following bridges:

County	Township	Route	Station	Span in Feet
Armstrong	Bethel	203	526/70	14
Armstrong	Boggs	66	1549	12
Armstrong	Brady's Bend	214	1379	32
Armstrong	Brady's Bend	214	1397	36
Armstrong	Brady's Bend	214	1416	36
Armstrong	Brady's Bend	214	1428	14
Armstrong	Brady's Bend	214	1434	36
Armstrong	Brady's Bend	214	1486	18
Armstrong	Brady's Bend	214	1586	18
Armstrong	East Franklin	251	1718/39	20
Armstrong	Gilpin	203	712/10	10
Armstrong	Mahoning	66	1131	18
Armstrong	Plum Creek	67	882/71	18
Armstrong	Cumru	274	203	10
Berks	Penn	310	379	26
Berks	Robeson	147	1687	10
Berks	Robeson	274	379	16
Berks	Robeson	274	615	8
Berks	Robeson	274	675	12
Berks	Robeson	328	28	22
Berks	Robeson	328	30	18
Cameron	Gibson	105	715	12
Cameron	Grove	105	768	12
Cameron	Portage	100	303	1 abut.
Cameron	Shippin	277	848	6
Cameron	Shippin	277	871	6
Cameron	Shippin	277	977	16
Clarion	Porter	66	824/50	16
Clearfield	Bell	62	893	20
Clearfield	Bell	221	2594/50	16
Clearfield	Bloom	59	967	20
Columbia	Fishing Creek	16	667/73	8
Crawford	Sadsbury	83	217/46	12
Crawford	Summerhill	295	108/68	12
Franklin	Franklin	272	890	12
Franklin	Franklin	272	921	12
Franklin	Washington	247	220/92	20
Fayette	Perry	288	901/55	10
Fayette	East Wheatfield	302	1702/69	8
Indiana	White	228	211	12
Indiana	Clover	237	440/60	12
Jefferson	Washington	59	2032/15	14
Lehigh	Upper Milford	158	1580	12
Lehigh	Upper Milford	158	1671	24
Lehigh	Washington	163	884	10
Monroe	Barrett	171	1289/50	20
Monroe	Paradise	169	405	14
Monroe	Pocono	168	356/35	10
Monroe	Pocono	168	373	10
Montgomery	Lower Merion	201	212/48	2-28
Pike	Lehman	167	1059	14
Schuylkill	Union	140	467	16
Sullivan	Colley	217	838/80	12
Susquehanna	Gibson	365	2144/75	10
Susquehanna	Harford	174	1275/64	12
Susquehanna	Marmony	227	1722/66	12
Susquehanna	New Milford	174	1572/46	12
Susquehanna	Oakland	10	1100	8
Venango	Cranberry	91	330/83	10
Warren	Pittsfield	89	2488	36
Wayne	Manchester	365	3242	20
Wyoming	Eaton	13	263	16
Wyoming	Eaton	13	284	12
Wyoming	Lemon	12	216	10
Wyoming	Mehoopany	13	601/80	16
Wyoming	Mehoopany	13	669/80	14

Plans and specifications will be furnished upon application to State Highway Department, Harrisburg, Pa. They can also be seen at office of the State Highway Department, Harrisburg; 1001 Chestnut Street, Philadelphia, and 904 Hartje Building, Pittsburgh, Pa.

LEWIS S. SADLER, State Highway Commissioner.

Bids received until August 5, 1919.

Legal Notice

BARNESVILLE, O.

Sealed bids will be received at the office of the Trustees of Public Affairs, City Building, Barnesville, Ohio, until 12:00 o'clock, noon, Tuesday, August 5, 1919, for furnishing 35 tons of 4-inch cast-iron water main, Class B, 200-foot head, 86 pounds pressure; pipe to be delivered f.o.b. Barnesville, Ohio, just as soon as possible after contract is awarded. Each bid to be accompanied by certified check of fifty dollars (\$50.00) that the successful bidder will enter into contract to furnish the above quantity of pipe. Trustees reserve the right to reject any or all bids.

By order of Trustees of Public Affairs.

D. J. BLAKEMORE, President.

IRA L. SMITH, Clerk.

Bids received until August 15, 1919.

Washington Suburban Sanitary District—Water Main Construction

WASHINGTON, D. C.

Sealed proposals will be received at the office of the Washington Suburban Sanitary Commission, 611 F Street, N.W., Washington, D. C., for Contract 6-W, until Friday, August 15, 1919, at 3:00 P. M., at which place and time they will be publicly opened and read.

37,000 feet 6-inch cast-iron water main.
26,000 feet 8-inch cast-iron water main.
2,000 feet 12-inch cast-iron water main.
8,500 feet 1½-inch to 2½-inch galvanized wrought steel temporary water main.
10,000 feet ¾-inch and 1-inch galvanized wrought iron house service pipes.
Cast-iron pipe, wrought-iron pipe (but not wrought-steel pipe), gate valves, valve boxes,

corporation cocks and goose necks will be furnished by the Commission.

On and after July 30, 1919, plans and specifications may be seen at the office of the Commission, and may be obtained at the office of the Chief Engineer of the Commission, Hyattsville, Maryland, upon the payment of five dollars (\$5.00) which will be refunded if plans and specifications are returned in good condition within ten days from the date of opening proposals.

WILLIAM T. S. CURTIS,
T. HOWARD DUCKETT,
EMORY H. BOGLEY,
Commissioners.

Bids received until August 26, 1919.

Highway Work

Office of the State Commission of Highways
ALBANY, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1:00 o'clock P. M. on Tuesday, August 26, 1919, for the improvement of the following highways:

MONTGOMERY.—Two highways—3.70 and 3.63.

RENSSELAER.—One highway—1.27.

SARATOGA.—One highway—9.06.

SUFFOLK.—One highway—5.86.

And also for the Completion of the Following Highways:

CAYUGA.—Two highways—6.06 and 5.45.

CHAUTAUQUA.—One highway—5.65.

FRANKLIN.—One highway—10.36.

LIVINGSTON.—One highway—8.34.

MADISON.—Two highways—6.54 and 5.65.

OSWEGO.—One highway—6.36.

SENECA.—One highway—2.13.

ULSTER.—One highway—10.24.

WASHINGTON.—One highway—2.06.

And also for the Completion of the Following Repair Contract:

CORTLAND.—One contract—cement concrete construction.

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the Division Engineers in whose division the roads to be improved and completed are located. The addresses of the Division Engineers and the counties of which they are in charge will be furnished upon request.

The especial attention of bidders is called to "General Information for Bidders" on the itemized proposal, specifications and contract agreement.

FREDERICK STUART GREENE,

Commissioner.

ROYAL K. FULLER, Secretary.

Bids received until August 11, 1919.

Notice to Contractors

MOUNT UNION, PA.

Sealed proposals for the construction of 21,400 square yards of paving on Pennsylvania Avenue, North Jefferson, West Water, East Water, North Division, West Market, East Market, Small South Jefferson and South Division Streets, Mount Union, Pa., will be received until 8:00 o'clock P. M. of the 11th day of August, 1919.

Alternate bids are requested, one on vitrified paving block on a concrete base and the other on a one-course reinforced concrete paving.

The work consists approximately of 21,400 square yards of paving, 6,000 cubic yards of excavation and 15,000 lineal feet of cement

curbing. All labor and all material will be furnished by the contractor.

Proposal sheets may be obtained from the Engineer, and the plans and specifications are open at his office for inspection. A set of the plans and a copy of the specifications may be obtained by depositing ten dollars (\$10) with the Engineer. This deposit will be refunded upon the return of the papers in good condition.

Bidders are requested to make appointments with the Engineer to go over the proposed improvement and to examine the plans and specifications.

Each bid must be accompanied by a certified check of two thousand dollars (\$2,000) as guarantee of the good faith of the bidder.

All proposals shall be addressed to William F. Eberman, President of Council, 106 Pennsylvania Avenue, Mount Union, Pa.

The Council of the Borough of Mount Union reserves absolutely the right to reject any or all bids.

WILLIAM F. EBERMAN,
President of Council,
106 Pennsylvania Avenue, Mount Union, Pa.
D. W. DILLMAN, Borough Engineer,
80-81 Altoona Trust Building, Altoona, Pa.

Pennsylvania State Highway Department, Harrisburg, Pa.—Sealed proposals will be received at the State Capitol until 10:00 A. M., August 19, 1919, when bids will be publicly opened and scheduled and contracts awarded as soon thereafter as possible for the reconstruction of the following pavements: 21,299 linear feet of Reinforced Concrete and Hillside Brick in Allegheny County; 11,640 linear feet of Reinforced Concrete in Armstrong County; 56,111 linear feet of Reinforced Concrete in Bedford County; 812 linear feet of Vitrified Brick in Bucks County; 13,232 linear feet of Reinforced Concrete and Hillside Brick in Cambria County; 5,651 linear feet of Reinforced Concrete in Carbon County; 29,586 linear feet of Bituminous Macadam (Penetration Method) on a Telford Foundation in Chester County; 7,314 linear feet of Bituminous Macadam (Penetration Method) on a Telford Foundation in Delaware County; 4,101 linear feet of Vitrified Brick in Fayette County; 71,063 linear feet of Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Lackawanna and Wyoming Counties; 16,218 linear feet of Reinforced Concrete in Lehigh County; 31,418 linear feet of either Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Luzerne County; 15,683 linear feet of either Bituminous Surface Course on a Concrete Foundation or Reinforced Concrete in Lycoming County; 2,431 linear feet of Reinforced Concrete in Mercer County; 8,226 linear feet of Reinforced Concrete in Northampton County; 22,287 linear feet of Reinforced Concrete in Washington County; and 89,002 linear feet of Reinforced Concrete and Hillside Brick in Westmoreland County. Bidding blanks and specifications may be obtained free, and plans upon payment of \$2.50 per set, upon application to State Highway Department, Harrisburg. No refund for plans returned. They can also be seen at office of State Highway Department, Harrisburg; 1001 Chestnut Street, Philadelphia, and 904 Hartje Building, Pittsburgh, Pa. LEWIS S. SADLER, State Highway Commissioner.

Bids will be opened at 1:00 P. M., August 29, 1919, for one (1) Compound Duplex Smith-Vaile Pump; capacity, 5,000,000 gallons; size, 24x36x18 inches; semi-rotative steam valves, water plunger, fibrous packed steel piston rods. Two (2) 125-H.P. R. T. Brownell Boilers. Three (3) 100-H.P. Stillwell Open Heaters. For bidding blanks apply to QUARTERMASTER, National Military Home, Ohio.

Pennsylvania State Highway Department, Harrisburg, Pa.—Sealed proposals will be received at the State Capitol until 10:00 A. M., September 2, 1919, when bids will be publicly opened and scheduled and contracts awarded as soon thereafter as possible for the reconstruction of the following pavements: 37,001 linear feet of One Course Reinforced Concrete and Hillside Vitrified Brick and 7,857 linear feet of either Bituminous Surface Course on a Concrete Foundation and Hillside Vitrified Brick or One Course Reinforced Concrete in Adams County; 16,579 linear feet of Reinforced Concrete in Butler County; 16,129 linear feet of One Course Reinforced Concrete in Carbon County; 12,355 linear feet of either Bituminous Surface Course on a Concrete Foundation or One Course Reinforced Concrete in Centre County; 32,128 linear feet of Bituminous Surface Course (penetration method) on a Telford Foundation in Chester County; 10,507 linear feet of Reinforced Concrete in Clarion County; 10,822 linear feet of One Course Reinforced Concrete in Clearfield County; 4,265 linear feet of either Bituminous Surface Course and Hillside Vitrified Brick on a Concrete Foundation or One Course Reinforced Concrete in Clinton County; 18,514 linear feet of One Course Reinforced Concrete and Hillside Vitrified Brick and 18,619 linear feet of either One Course Reinforced Concrete and Hillside Vitrified Brick or Two Course Reinforced Concrete and Hillside Vitrified Brick in Crawford County; 64,227 linear feet of One Course Reinforced Concrete and 7,900 linear feet of either Bituminous Surface Course and Hillside Vitrified Brick on a Concrete Foundation or One Course Reinforced Concrete and Hillside Vitrified Brick in Erie County; 3,812 linear feet of One Course Reinforced Concrete in Indiana County; 31,268 linear feet of either One Course Reinforced Concrete or Vitrified Brick in McKean County; 24,049 linear feet of either Bituminous Surface Course on a Concrete Foundation and Hillside Vitrified Brick or One Course Reinforced Concrete in Mifflin County; 12,935 linear feet of either Bituminous Surface Course on a Concrete Foundation or One Course Reinforced Concrete in Potter County; 32,320 linear feet of either Bituminous Surface Course on a Concrete Foundation or One Course Reinforced Concrete in Snyder County; 6,191 linear feet of One Course Reinforced Concrete and Vitrified Brick in Susquehanna County; 24,113 linear feet of either Bituminous Surface Course on a Concrete Foundation or One Course Reinforced Concrete in Tioga County; 7,936 linear feet of One Course Reinforced Concrete in Warren County; and 4,136 linear feet of Bituminous Surface Course on a Concrete Foundation in York County. Bidding blanks and specifications may be obtained free, and plans upon payment of \$2.50 per set, upon application to State Highway Department, Harrisburg. No refund for plans returned. They can also be seen at office of State Highway Department, Harrisburg; 1001 Chestnut Street, Philadelphia, and 904 Hartje Building, Pittsburgh, Pa. LEWIS S. SADLER, State Highway Commissioner.

Bids received until August 25, 1919.

Constructing Garbage Reduction Plant

SYRACUSE, N. Y.

Sealed proposals will be received by the Board of Contract and Supply at their office, 311 City Hall, Monday, August 25, 1919, at 1:30 P. M., for constructing a garbage reduction plant. Contractors out of city are requested to enter a proposal for the above contract. Plans and specifications will be sent to any responsible contractor. Apply at once.

R. D. RONEY,
311 City Hall, Syracuse, N. Y.

OFFICIAL ADVERTISING

Bulletin No. 250—88 pages—is a
SURE MONEY SAVER

Get it—before buying

Contractors' Equipment, Cars, Ralls, Mixers, Engines, Piling, Pipe, Bridges, Tanks.

ZELNICKER IN ST. LOUIS

for putting in sewer in west portion of city at \$376,063.

*N. Y., Yonkers—Bd. of Contract and Supply awarded to Joseph L. Cuzzo contract for completion of Kimball Ave. sewer. When bids for the work were opened Cuzzo was lowest with \$17,100.05.

WATER SUPPLY

Ark., Conway—City contemplates improving waterworks system, which will include construction of large settling basin, completion of emergency steam power pumping station; replacing with wooden mains the defective portions of present wooden mains. E. V. Leveret, Supt. of Bd. of Comrs.

Fla., Pablo Beach—Proposition to issue waterworks bonds to amount of \$15,000 carried at recent election.

Ida., Preston—Franklin Co. contemplates building reservoir on Worm Creek to cost \$200,000.

Ida., Preston—City Council plans to improve water system at cost of \$35,000.

Ida., Buhl—Improvements to include new reservoir and filtration plant, with extension of pipe line, is under consideration by council.

Ill., Decatur—City Council formally ratified decision that new dam should be constructed at 610 level upon foundation designed to carry the weight of a dam built to 615 level and instructed Engrs. Pearce and Greeley to prepare specifications.

Ill., East Moline—City Council has submitted ordinance for water main extension to involve expenditure of \$41,000.

Ill., Lockport—City contemplates extension of water main system at cost of \$34,488, and sewer system at \$41,878.

Ind., Evansville—Waterworks Dept. has decided to encourage installation of water meters.

Ind., Fort Wayne—Conditions in water supply have led to recommendation by citizens' committee that filter plant be installed at once. Bond issue of \$50,000 asked for that purpose and general improvement of the system. B. J. Griswold, secretary of committee.

Mass., Newton—Newton Bd. of Aldermen, at special meeting, appropriated \$17,000 for installation of pumping engine to guard against emergency in connection with city's water supply. The appropriation will cover cost of pumping machinery and necessary building to house it. It will be placed on Waban Hill, in Chestnut Hill section.

Mass., Pittsfield—See "Sewerage."

Minn., Foley—Waterworks and sewer; \$40,000. Engrs., Chute & Bradley, St. Cloud, Minn. E. Rive, Mayor. Finishing plans. Will call for bids at once. 60,000 gal. steel tank, 1,000 gal. per minute pump and motor.

Neb., Bridgeport—City voted July 15 on issuing 6 per cent semi-annual water extension bonds to amount of \$15,000.

Neb., Falls City—Authorized at recent election \$50,000 waterworks bonds.

Neb., Omaha—Election may be held Sept. 9 to vote on issuance of \$5,000,000 for water power projects on Platte of Loup Rivers to obtain electric power for Omaha.

Neb., Rushville—Election held July 22 to vote water bonds to amount of \$20,000.

N. J., Passaic—Passaic Co. Bd. of Freeholders adopted resolution to have plans made for construction of flume to take care of waters of Weasel Brook.

N. Y., Buffalo—It is planned to install filtration plant in public school swimming pool at cost of \$36,000.

N. Y., Syracuse—City has fund of \$139,833 available for construction of reservoir in Thornden.

N. C., High Point—Water system bond issue of \$100,000 will soon be available. R. L. Pickett, city manager.

O., Wooster—Machinery and pipe for water system are to be bought. Service Dir. Miller.

Okla., Frederick—At meeting of Chamber of Commerce indorsement was given to proposition of bond issue of \$80,000 for purpose of placing larger water mains leading from supply wells west of the city to city reservoir, distance of about five mi.

Okla., Kiefer—Repairs and additions are to be made to water system. T. L. Green, Engr., Miami, Okla.

LIGHTING AND POWER

Col., Grand Junction—Movement has been started at Collbran for installation of hydro-electric plant to supply power and light to practically every section of Plateau Valley.

***In., Story City**—David G. Feshut Co. awarded contract for electric light system and power house at \$36,000.

In., Traer—City voted on issuance of \$50,000 bonds for municipal plant to furnish city with light and steam heat.

Kan., Kansas City—Riverview State Bank, of Kansas City, was successful bidder for 4% per cent electric light bonds to amount of \$250,000.

Mich., Lansing—Voters have approved issuance of bonds for public improvements amounting to \$1,321,000. Bond issues approved are: Municipal light and water plants, \$650,000; isolation hospital, \$100,000; addition to cemetery, \$38,000.

Minn., St. James—An issue of \$20,000 lighting plant improvement bonds authorized by City Council.

Neb., Minden—\$35,000 not exceeding 6 per cent electric light extension bonds voted. Geo. E. Hammond, City Clk.

N. Y., Oswego—City intends to construct and equip a complete electric lighting system at cost of \$90,000. Major Bense, Consulting Engr.

O., East Palestine—Expansion of municipal power plant to take care of industrial plants; \$90,000.

Tex., Bryan—City is to purchase Bryan power plant from H. T. Lawter & Sons provided citizens vote bonds for same. An election was ordered for Aug. 26 on bond issue of \$75,000 for purchase and improvement of the plant.

Tex., Dennison—See "Streets and Roads."

Tex., San Angelo—City has decided to build its own water, light and power plant; \$500,000 has been appropriated.

S. D., Gregory—See "Sewerage."

Wash., Seattle—City Council has passed bill favoring extension and authorizing issuance and sale of \$1,350,000 of light and power utility bonds to cover the cost of steam plant on Lake Union, adjoining present plant.

FIRE

Del., Georgetown—The Volunteer Co. has raised funds for equipment.

Fla., Pablo Beach—Question of issuing bonds for fire protection equipment is being considered.

In., Washington—City will purchase fire equipment, including a triple-combination pumper with ladder equipment. C. C. Reister, Chief.

Mass., Dedham—Town may purchase motor pumping engine and motorize all apparatus. Address Clk. of Council.

Minn., Minneapolis—Fire Chief Ringer states that improvement budget presented to city controller includes new station at Hawthorn Ave., to cost \$35,000; 2 motor triple combinations, to cost \$12,500; 2 motor four-wheeled tractors, to cost \$7,500; 100 new fire alarm boxes, to cost \$15,100; terminal apparatus for 8 new circuits, \$5,000; 50 miles of wire for new circuits, \$3,000; a jolter transmitter, \$1,000; 25 punching registers, \$3,750; 21,752 ft. of cables, \$15,144.

Mo., St. Joseph—Fire Dept. bond issue of \$50,000 has been marketed. J. R. Clay, City Compt.

N. Y., Port Jervis—Purchase of fire apparatus is under consideration.

Tex., San Antonio—The sum of \$150,000 is appropriated to provide four additional fire stations, to extend fire alarm system, and to erect garage and machine shop for use of Fire Dept.

N. Y., Monticello—Recent \$300,000 fire showed the need of some kind of pumping apparatus, in which fire department is wholly lacking.

N. Y., Parishville—A fire company has been organized and equipment will be purchased. Address Town Clk.

N. Y., Scotia—Purchase of additional apparatus for out-of-town district is recommended by Chief Alvin C. Spitzer.

BRIDGES

Fla., Charlotte Harbor—Bonds have been voted for construction of concrete bridge connecting Charlotte Harbor and Punta Gorda. Chmn. of Comrs. of Hillsborough Co., Tampa, Fla.

Ga., Savannah—Bridge to be built at Sisters Bluff; \$100,000 to be raised. Contract will be let soon. Mills B. Lane, Pres., Altamaha River Bridge Co.

Ill., Joliet—Co. Court has authorized construction of reinforced concrete arch viaduct over Jefferson St., to cost \$18,000.

Ill., Sterling—Bridge; \$200,000. Asst. State Engr., Geo. F. Burch, Capitol Bldg., Springfield, Ill. Owner, city of Sterling, K. E. Ward, Clk., City Hall.

Ind., Indianapolis—Bd. of Pk. Comrs. have ordered bridge over Bean Creek in Garfield Park, cost to be \$25,000.

Mich., Lansing—Bond issue of \$25,000 for concrete traffic bridge is approved.

N. Y., Watertown—Another bond issue will be necessary to build new Court St. bridge was decided at meeting of Bd. of Pub. Wks., and the awarding of contract is held up until it is decided whether or not to hold election and vote another issue. Approximately \$120,000 more will be needed to build bridge as planned. The sum of \$300,000 was originally voted for bridge two years ago, but since then costs of construction have so increased that to build the same bridge the lowest estimate was that of Peckham Construction Co., who bid \$335,815.21.

O., Bellaire—Proposed new Belmont St. bridge estimated at \$30,000.

O., Lakewood—Another bridge over Rocky River contemplated; \$1,000,000.

Pa., Gettysburg—Bridge; \$15,000; between Harrisburg and Gettysburg, Main Hwy. H. Allen Yohe, Clk., Adams Co., Gettysburg; contemplated.

Pa., Harrisburg—State will ask bids within a month for construction of memorial bridge.—Gen. Snyder, State Audr.

MISCELLANEOUS

Ala., Birmingham—Aug. 18 city will vote on bond issue of \$500,000 for purpose of building auditorium.

Cal., Newport-Mesa Irrigation Dist.—An issue of \$50,000 irrigation bonds was sold to Lumbermen's Trust Co., San Francisco.

Ind., Evansville—With view of establishing another municipal swimming pool, Harvey Herndon, Pres. of Bd. of Pub. Wks., has asked Park Supt. Humphreys for approximate cost and possible location.

Ind., Indianapolis—Marion Co. asks bids on \$138,000 bonds for improvement. E. G. Sourbier, Treas.

In., Davenport—City officials contemplate sinking artesian well to provide water for proposed municipal bathing pool. Daily output of 2,000,000 gals. of water. Roscoe E. Sawistowsky, City Engr.

La., Baton Rouge—At meeting of Comm. Council special election was called for Aug. 26 to vote \$100,000 of bonds to buy park site in heart of the city and to build memorial to the soldiers who participated in the war.

La., New Orleans, will receive sealed bids until Aug. 12 for \$600,000 4½ per cent semi-annual 31-year average refunding bonds.

Minn., Dassel—Recent election authorized funding bonds to amount of \$25,000.

Mont., Butte—Bids in Aug. 6 for \$25,000 comfort station bonds. Shelby Irvine, City Clk.

N. J., Metuchen—Chamber of Commerce of this city are considering the establishment of playgrounds in borough. Estimates will be prepared soon.

N. Y., La Salle—At Village Hall, the Village Bd. will receive sealed bids for sale of \$13,000 bonds, to make possible the purchase of village park and Carnival grounds, and a village hall site, in accordance with last spring's election, when such proposition was carried.

O., Bluffton—Proposal for issuing municipal bonds in the sum of \$20,000 will be submitted to Bluffton voters for their approval at November election, according to plans now being made by town council.

Ore., Hood River—Utilizing portion of lot at corner of Front and Oak Sts., the city of Hood River will establish a comfort station for passing motor tourists. The buildings will be of concrete and the plot beautified with shrubs and flowers.

***Ore., Portland**—Contracts for digging channel from Columbia River to Columbia River slough, to increase the flow of the slough and make it possible to use that waterway as sewerage outlet, was signed on behalf of city of Portland and by Pacific Bridge Co. At least one year will elapse before job can be completed. Contract price, \$309,000.

N. Y., Utica—City Controller S. W. Snyder will receive sealed bids until Aug. 11 for \$302,550 4½ per cent semi-annual various improvement bonds. Certified check for 2 per cent required.

Pa., McDonald—City will vote Aug. 14 on \$70,000 municipal building bonds.

Pa., Pittsburgh—City expects to ask bids soon on bond issues amounting to \$900,000, to be used for parks and playgrounds of city.

Tex., Galveston—\$10,000 has been appropriated for construction of two rest rooms for city. Plans prepared. Bids will be asked.

Tex., Orange—The wharf and dock bond issue of \$150,000 was purchased by Terry Bros. & Co., of Toledo, O., for \$151,000. Completion of local wharves and docks will begin immediately.

Tex., San Antonio—Reclamation work and widening and straightening rivers is estimated to cost \$200,000. A new market house to replace the old one and the construction of a cold storage plant call for \$200,000 of the bond issue.

Va., Richmond—Mayor Alnslie will offer plans for bond issue of approximately \$5,000,000 to cover cost of needed public improvements. Dr. E. C. Levy, Dir. of Pub. Welfare, has stated that there is serious need for better market facilities. Improvements contemplated in connection with proposed bond issue include plans to wall in Shockoe Creek. A portion of the creek has been walled in and it is estimated that work remaining will cost at least \$2,000,000.

Wash., Seattle—Bids have been called for by City Comptroller, to be opened R. C. Desrochers, Secy.

B. C., Victoria—Contract for big Esquimalt dry dock will be let in October and preliminary work on dock site will commence early in November, according to statement made by Dr. S. F. Tolmie, M. P. for Victoria.

B. C., Okanagan Centre—Dept. of Pub. Aug. 5 for construction of public wharf. Wks., Ottawa, will receive tenders until Sept. 6, for purchase of \$790,000 in municipal railway bonds.

Serbia—Former government official of Serbia, about to establish technical office for public works, requests to come in touch with exporters of cement, concrete, brick, gas engines, rails, wagons, small locomotives, used in construction of railroads, and construction machinery. For further information apply to Bureau of Foreign and Domestic Commerce, Washington, D. C. Opportunity No. 39, 130.

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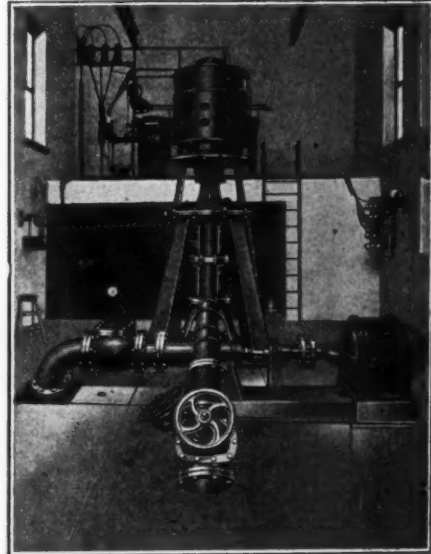
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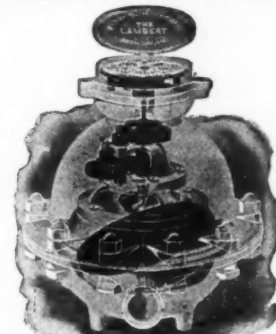
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STREETS AND ROADS.

Ark., Helena. 11 a.m., Aug. 12. 6.68 ml. macadam, asphaltic concrete on 4-in. base, warrenite on 4-in. base or Portland cement concrete road, involving 21,700 cu. yd. embankment, five acres clearing and grubbing, 410 lin. ft. 15 and 18-in. vitrified clay, metal or concrete pipe, 55,000 sq. yd. macadam or 35,300 sq. yd. other pavement; also 61.3 ml. Portland cement concrete, one-course, asphaltic concrete on 5-in. concrete base, or warrenite on 5-in. concrete base pavement, involving 255,800 cu. yd. embankment, 160 acres clearing and grubbing, 2,889 lin. ft. 15 to 24-in. vitrified clay, metal or concrete pipe, five bridges, 402,180 sq. yd. paved roadway, etc., all in Phillips Co.—Monroe & Parmlee, Engrs., P. O. Box 66.

Ind., Crown Point. 1 p.m., Sept. 8. Three gravel roads in Ross, St. John and Cedar Creek Twps.—G. M. Foland, Co. Aud.

Kan., Iola. 10 a.m., Aug. 11. 4½ ml. brick and concrete pavement in Allen Co.—C. E. Stebbins, Engr.

Mass., Boston. noon, Aug. 12. Sheet asphalt, topeka, bitulithic or fibertine pavement in Brighton.—T. F. Sullivan, Comr. Pub. Wks., 508 City Hall Annex.

Mo., Jefferson City. 3 p.m., Aug. 11. Grading and constructing walks and drives.—E. W. Stephens, Chmn., State Capitol Comn. Bd.

Neb., Red Cloud. Aug. 25. 34 blocks streets and four blocks alleys with brick, sheet asphalt or asphaltic concrete.—City Clk.

N. Y., Dexter. Aug. 9. Brick pavement, involving 1,250 cu. yd. excavation, 1,100 lin. ft. 3-in. tile drain pipe in place, 3,550 sq. yd. 5-in. concrete base, 1,078 lin. ft. concrete curbing and 3,550 sq. yd. brick pavement.—C. O. Phelan, Vil. Clk.

N. Y., Buffalo. noon, Aug. 15. Repaving roadway with asphalt.—J. F. Malone, Comr. of Parks and Pub. Bldgs.

O., Cincinnati. noon, Aug. 11. Widening and paving with granite on city street.—Chief Engr., Dept. Pub. Serv.

O., Cleveland. noon, Aug. 13. Grading, draining, curbing, paving, repaving, resurfacing and improving various city streets.—Comr. Engrg., 618 City Hall.

O., Youngstown. noon, Aug. 13. Grading and paving in various streets.—F. M. Little, Engr., City Hall.

O., Van Wert. Sept. 2. Improving road in Van Wert Co.—R. J. Jones, Court House.

O., Chardon. Aug. 14. 4.92 ml. grading, bridges and culverts in Geauga Co.—D. L. Johnson, Clk., Joint Bd. of Russell and Newbury Twp.

O., Logan. Aug. 15. Brick paving.—W. I. Krieg, Vil. Clk.

O., Warren. Aug. 18. Three ml. two-course waterbound macadam 14 ft. wide, surface treated; also 2½ ml. two-course bituminous macadam road 12 ft. wide in Mecca and Bristol Twps., both in Trumbull Co.—Mable H. Evans, Clk., Co. Comrs.

STREETS AND ROADS.

La., Lake Charles.—Application for construction of 11.8 ml. of road from Vinton to Sabine River, opposite city of Orange, has been made by Police Jury of Calcasieu Parish and has been favorably acted upon by Hwy. Dept.

N. J., Elizabeth.—Ordinance has been passed to provide for establishment of grades in Monmouth Rd., Salem Pl., Springfield Rd., Park Ave. and Summit Rd.

N. C., Asheville.—City Comr. passed first reading on motion to issue \$160,000 worth of bonds for construction of new streets and reconstruction of old ones in the city.

N. C., Lexington.—Authorities of Erlanger Cotton Mill presented proposition for paving road from Lexington to limit of their property on the Winston-Salem Rd., a distance of half a mile. The mill proposes construction of modern hard-surface boulevard on basis of the mill paying one-fourth of cost, the Federal Government one-half and the Rd. Bd.

Pa., Harrisburg.

10 a.m., Sept. 2. 37,001 lin. ft. one-course reinforced concrete and hillside vitrified brick and 7,857 lin. ft. bituminous surface course on concrete foundation and hillside vitrified brick, or one-course reinforced concrete in Adams Co.; 16,579 lin. ft. reinforced concrete in Butler Co.; 10,129 lin. ft. one-course reinforced concrete in Carbon Co.; 12,355 lin. ft. bituminous surface course on concrete foundation, or one-course reinforced concrete in Centre Co.; 32,128 lin. ft. bituminous surface course on telford foundation in Chester Co.; 10,507 lin. ft. reinforced concrete in Clarion Co.; 10,822 lin. ft. one-course reinforced concrete in Clearfield Co.; 4,265 lin. ft. bituminous surface course and hillside vitrified brick on concrete foundation or one-course reinforced concrete in Clinton Co.; 37,133 lin. ft. one-course reinforced concrete and hillside vitrified brick or two-course reinforced concrete and hillside vitrified brick in Crawford Co.; 64,227 lin. ft. one-course reinforced concrete and 7,900 lin. ft. bituminous surface course and hillside vitrified brick on concrete foundation or one-course reinforced concrete and hillside vitrified brick in Erie Co.; 3,812 lin. ft. one-course reinforced concrete in Indiana Co.; 31,268 lin. ft. one-course reinforced concrete or vitrified brick in McKean Co.; 24,049 lin. ft. bituminous surface course on concrete foundation and hillside vitrified brick on one-course reinforced concrete in Mifflin Co.; 12,935 lin. ft. bituminous surface course on concrete foundation or one-course reinforced concrete in Potter Co.; 32,320 lin. ft. bituminous surface course on concrete foundation or one-course reinforced concrete in Snyder Co.; 6,191 lin. ft. one-course reinforced concrete and vitrified brick in Susquehanna Co.; 24,113 lin. ft. bituminous surface course on concrete foundation or one-course reinforced concrete in Tioga Co., and 4,136 lin. ft. bituminous surface course on concrete foundation in York Co.—L. S. Sadler, State Hwy. Comr.

Wash., Everett. Aug. 12. Paving section or road.—Co. Comrs.

W. Va., Moundsville. 4 p.m., Aug. 16. Paving various streets.—L. K. Stidger, City Clk.

SEWERAGE.

Ind., Muncie. Aug. 11. Local sewer in various streets.—H. Deardorff, Engr.

Minn., Litchfield. Aug. 16. Twenty blocks vitrified sewer pipe.—L. P. Wolff, Guardian Life Bldg., St. Paul.

Mo., Holden. 2 p.m., Aug. 11. Lateral sewer in two districts and main sewer and disposal plant in joint district, involving trenching and backfilling, 33,987 ft. 8 to 15-in. vitrified pipe, 844 ft. Y's, 80 manholes, 62 extra-depth manholes, 15 flush tanks, 15 sewer connections, 1,070 ft. ¾-in. G. I. pipe, and one septic tank, sludge bed, outlets, etc.—Archer & Stevens, Engrs., Kansas City.

N. Y., Watertown. 8 p.m., Aug. 15. 445 ft. 8-in. and 780 ft. 10-in. tile sewer with manholes, house laterals, etc.—City Engr.

one-fourth. Delegation of citizens owning property on Winston-Salem Rd. just beyond the Erlanger property offered Rd. Bd. the same proposition for construction of similar type of highway from Erlanger property on to Ebenezer Church, a distance of two ml. Proposition is under consideration and will probably be accepted.

O., Blanchester.—Contract let soon for paving Broadway.

O., Canton.—Stark Co. has funds available for following roads: Lincoln Hwy., \$210,000; Massillon-Canal Fulton Rd., \$98,000; Canton-Bollivar Rd., \$57,000; Massillon-Brewster Rd., \$39,000; Meyers Lake Rd., \$13,000; Louisville-Ravenna Rd., \$16,000.

O., Lorain.—City will build concrete highway from Lorain to Oak Point; cost, \$150,000.

O., Georgetown.—Market route 6-A, to be known as Grant Hwy., financed by Adams Co. and State; ready to advertise at once.

WATER SUPPLY.

D. C., Washington. 2 p.m., Aug. 20. Sale of one horizontal, triple-expansion, crank and flywheel Nordberg pumping engine, 6,700,000 gal. daily capacity.—Secy., Bd. Comrs., 509 District Bldg.

Mass., Boston. noon, Aug. 14. Refiltration plant at bath house.—Haven & Hoyt, 220 Devonshire St.

Mass., Boston. noon, Aug. 22. Furnishing and installing sluice gates, air rams and counterweights at gate house, Moon Island reservoirs, Squantum, Mass.—T. F. Sullivan, Comr. Pub. Wks., 508 City Hall Annex.

Okla., Garber. 7 p.m., Aug. 18. Waterwork system, involving laying 12,000 ft. 6-in. and 10,380 ft. 8-in. cast iron pipe, 11,000 ft. 2-in. galvanized pipe and main pump house, pump houses over wells, wooden storage tank, etc.; one 300-g. p. m. motor-driven triplex pump, and either two 150-g. p. m. or two 100 motor-driven vertical centrifugal pumps; 447 tons 6 and 8-in. cast iron pipe, 15,000 lb. standard specials, etc.; 23 6-in. hydrants, six 8-in. valves, nine 6-in. valves and 29 2-in. valves.—Black & Veatch, Engrs., Interstate Bldg., Kansas City, Mo.

Wash., Seattle. noon, Aug. 11. Installing 8,800 ft. 6-in. wood pipe and fittings, concrete tank and 400 ft. tile drain.—F. J. Sheehan, Secy., Bd. Water Dist., King Co.

FIRE EQUIPMENT.

Tex., Galveston. 5 p.m., Aug. 12. Furnishing one hook and ladder truck.—W. R. Willard, City Purchasing Agent.

BRIDGES.

Ill., Springfield. 10 a.m., Aug. 23. Bridge in various locations in state.—State Hwy. Dept.

O., Youngstown. Aug. 11. Bridges in Mahoning Co.—F. H. Vogan, Co. Clk.

O., Youngstown. Aug. 13. Bridge over Andrews Hollow.—C. F. Ohl, Clk., Serv. Dir.

O., Warren. Aug. 18. Bridge in Farmington Twp., Trumbull Co.—Mabel H. Evans, Co. Clk.

O., Bryan. Aug. 18. Bridge in Pulaski Twp., Williams Co.—C. R. Lowe, Co. Clk.

O., Akron. Aug. 21. Bridge over Wolf Creek, Copley Twp., Summit Co.—L. M. Kauffman, Clk., Co. Comrs.

O., Chillicothe. Aug. 25. Bridge in Ross Co.—W. S. Barrett, Co. Aud.

MISCELLANEOUS.

D. C., Washington. 2 p.m., Aug. 19. Repairing and wharfs.—Chief Clk., Engrg. Dept., 427 Dist. Bldg.

Mass., Boston. noon, Aug. 12. Dredging deposits at Calf Pasture, Dorchester, and Stetson's Dock, South Boston.—T. F. Sullivan, Comr. Pub. Wks., 508 City Hall Annex.

N. Y., Syracuse. 1.30 p.m., Aug. 25. Garbage reduction plant.—R. D. Roney, 311 City Hall.

Okla., Frederick.—Tillman Co. budget for roads and bridges for coming year has been very well cared for by excise board. This Co. is contemplating bond sufficient to put hard-surfaced roads throughout major portion of the Co., traversing the Co. from east to west and north to south, which will give Co. a splendid hard-surfaced road system.

Pa., Belfast.—Co. Comrs. intend to pave highway between Belfast and Wind Gap. Cost expected to be \$200,000.

Tex., Brownwood.—Mayor P. L. Hohlett, City Mgr. E. R. Breshear, returned from Dallas and Fort Worth, where they went to inspect methods of street paving. A move is now on to repave or resurface all streets which were paved several years ago and several new ones to be included.

Tex., Rusk (Cherokee Co.).—In election on question of issuing \$350,000 road bonds in Rd. Dist. No. 2 resulted in favor of proposition.